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Molds for Rubber Goods—I

Soft Metal Molds for Balls, Dolls, Toys, and Hollow Hard Rubber Fittings—Mold Casting Equipment—Matrix—Metal—Advantages—Application and Service Value of Soft Metal Molds

Webster Norris

THE facility with which plastic raw rubber mixings can be formed into any shape desired gave rise to the use of molds for vulcanizing rubber in both solid and hollow forms. Various materials have been used for making rubber molds. Metal molds are, of course, preferred because of their accuracy of dimensions, surface finish, and durability.

In the early period of rubber molded goods production, rubber manufacturers resorted to making such molds as they needed by casting them in babbitt metal. This method of mold making was formerly widely used in rubber factories producing molded mechanicals and specialties.

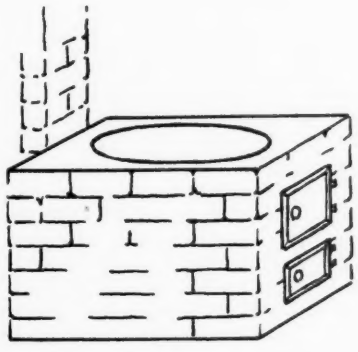


Fig. 1. Melting Furnace

Although soft metal molds are now largely superseded by those machined in cast iron, steel, and aluminum alloys, they have not completely disappeared from current rubber manufacturing practice because of their convenience, low cost, and special adaptation for small and occasional orders for molded specialties.

Soft Metal Molds

Soft metal molds are cast in ordinary babbitt metal, which is melted in an open iron pot of such capacity as the work requires. Formerly, in the case of making molds for bicycle tires, the melting pot was about 4 feet in diameter and hemispherical in shape. The pot is supported in a cast iron plate which covers a brick furnace setting having grate and ash pit as shown in Figure 1. The casting equipment comprises a sheet iron covered table, casting box, matrices, and a hand press. Other accessories used in the manufacture of soft metal molds are fire tools, skimmers for dross, and ladles for dipping and pouring the metal.

The matrix or model for making a soft metal rubber mold is made in iron or steel machined to size and finished with a smooth surface. If the rubber object to be molded is symmetrical in form, the matrix, of course, will be a model of one side only since symmetrical cavities can be cast from such a matrix. An example is a ball or a hard rubber pipe fitting for a syringe. An unsymmetrical shape such as a doll, of course, requires two matrices, one for the front and the other for the back.

In any case the matrix is attached to a base plate by screws entering it from the under side of a casting plate, as A in Figure 2.

Such a plate is shouldered on its lower edge to receive the casting box. As an example, the matrix B represents one side of a pair of symmetrical hard rubber outlet fittings for a fountain syringe. On one end on top of the plate is located a circular matrix C for the dowel pin, and at the opposite end is a corresponding pin cavity D. Thus every casting from the matrix plate gives a half cavity of the object, with a dowel pin cavity and a soft metal dowel pin. The locations of the pin matrix, object matrix, and pin cavity are suitably spaced to be in proper registration when two half molds are faced together for shaping and curing the finished rubber article. After the object matrix is mounted on the casting plate any number of molds may readily be obtained at the minor expense of casting. Thus the number of molds can be adjusted to the needs of production.

Casting Box

The casting box is a cast-iron receptacle, A shown in Figure 3, furnished with a heavy wire handle B used to

lift it when moved from the hot casting C. The mold metal is poured into the box at D, and the box removed from the casting by prying it up with hand irons placed under the lugs E.

Casting

During the process of casting by pouring the molten metal from a hand ladle the assembly shown in Figure 3 is held together in a screw hand press, Figure 4, the head of which carries a pair of lugs A, A to apply pressure at each end of the casting box as indicated in the figure. Leakage of the fluid metal from the casting box is prevented by the chilling effect of water soaked cotton cloth wrapped around the joint between matrix plate and casting box. A side view of a pair of mated soft metal mold castings is indicated in Figure 5.

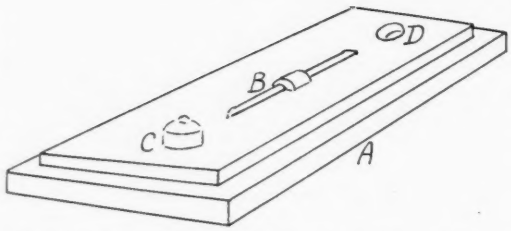


Fig. 2. Casting Plate with Matrix and Dowel Pin

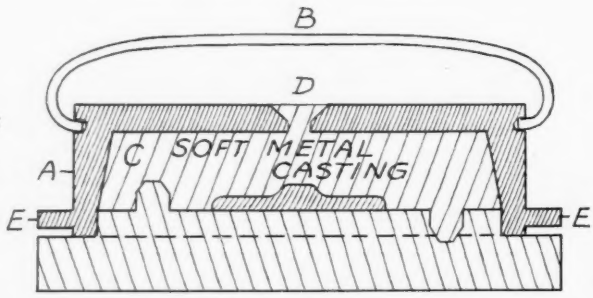


Fig. 3. Casting Box and Matrix Plate Assembly

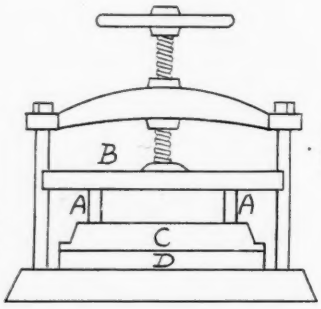


Fig. 4. Hand Press Used in Casting Mold

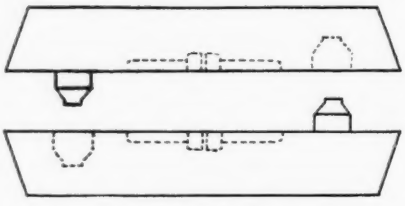


Fig. 5. Soft Metal Mold Casting

The metal used for casting is a mixture of tin, zinc, and antimony similar to type metal. It is used repeatedly, and about 40 per cent metal is salvaged from the dross from the melting pot. A half mold casting can be made in 20 minutes. Thus one and a half molds can be made in an hour. By careful handling, soft metal molds will yield 24 to 36 press cured articles before they are distorted in press work. They were formerly generally used for molding dolls, hollow balls, and toys. In that work the mold halves were held firmly in place by setting several molds together in a heavy iron frame or "jack" and securing them in position by hand driven wedges. Thus assembled, the objects in the molds were cured in an open steam vulcanizer. The necessary inflation of the articles was caused by steam generated by the curing heat from water individually contained in each article.

Soft metal molds are still used for curing hard rubber fittings for bulbs, syringes, water bottles, etc. The method is not one for volume production because the molds are too heavy and easily damaged. One large manufacturer of molded single tube bicycle tires, however, depended upon soft metal molds for their production as well as for many molded specialties.

In the case of the tire molds the soft metal was cast into cast iron shells with exterior lugs for bolting around their circumference for open cure. The soft metal was cast flush with the face of the iron shell that contained it and was held by a rivet like projection of the soft metal through the back or closed side of the iron shell. The rivet was self-formed by the fluid soft metal when poured. Tire cavities were quickly and easily turned in the encased soft metal, and several tire sizes could be turned in the castings made in the same size shell. The method for tires dropped out of use with the advent of the wrapped method of tire making.

Soft metal molds are utilized to a limited extent for the production of small hollow rubber articles without fabric construction and cured under light inflation pressure. A half or full model only is required, from which as many molds may be cast as are warranted by production. These can be recast at small expense as needed for the same or other goods. This method of mold making serves well for small specialty shops and experimental or development work.

The die casting method of mold making is the modern machine successor to the hand cast method here described. Die cast molds are of lighter metal mixtures affording greater accuracy and durability at greater cost.

Hopes for World Rubber Conference

At annual meeting of Harrisons & Crosfield, Ltd., London, England, Chairman Eric Miller stated: "Until producers of primary commodities are able to secure fair prices there can be no revival of general prosperity. We have seen numerous attempts to improve matters by government purchases of surplus stocks, but all these are doomed to fail unless future production is capable of regulation. The solution must be found if a complete breakdown of our economic system is to be averted."

World production of rubber for 1931, he said, is estimated at 775,000 tons, and absorption at about 680,000. The hope that governments concerned would rescue the industry as in the 1920 to 1922 crisis has deterred many producers from slowing down. Nearly half the planted rubber area is in hands of peasant proprietors, who, at the lower price of rubber, try to extract more from the trees to obtain food for their families.

"Is it right," Mr. Miller asked, "that the rubber-growing industry, which furnishes basic raw material on which modern transportation depends, should be allowed to drift to a condition of demoralization, which jeopardizes the livelihood of producers and may seriously affect future supplies? Government of the Dutch East Indies has cooperated with other countries to regulate tin supplies; let us hope it will soon join in an international rubber conference."

Making Rubber Thread—II[1]

A Survey of United States Patents Relating to the Methods of Manufacturing Rubber Thread

Joseph Rossman, Ph. D.

ACCORDING to Bommer's U. S. Patent No. 1,764,775, June 17, 1930, rubber thread is made from tubular stock which is drawn over a mandrel that is of less diameter throughout the major portion of its length than the inside diameter of the stock, thus facilitating the traveling of the tubular stock along the mandrel. At the cutting end of the mandrel, however, the diameter is the same as the inside diameter of the rubber stock so that the rubber tube will have a snug fit on the mandrel without being subjected to tension.

The mandrel is provided with a projecting shaft adapted to be engaged in a suitable head stock; means are provided to rotate the head stock and hence the shaft and mandrel and also the stock carried by the mandrel. The tubular stock is engaged adjacent to the cutting end of the mandrel by a plurality of friction rollers rotated by rotation of the mandrel and the stock. Means are provided to adjust the friction or pressure of the rollers upon the stock, and means also are provided to adjust the angle of the rollers relative to the stock.

Fixed on the mandrel shaft, and adapted to abut against the end of the mandrel, is a cutting or shearing member in the form of a collar, against which a circular rotary knife is adapted to abut. This collar has a relatively thin shearing edge against which the knife bears; the collar thus wears evenly and squarely with relation to the mandrel.

The shearing edge thus need not be squared off or trued. This collar is reversible, having two identical shearing surfaces so that when one shearing edge is worn down, the collar may be reversed and the second shearing edge brought into engagement with the knife, thus further increasing the efficiency, economy, and long life of the machine.

By varying the pressure of the friction rollers and also by varying the angle of it, any desired width of rubber thread can be produced from the tubular rubber stock.

The rotary cutting knife is adjustable laterally of the mandrel and is also adjustable longitudinally to compensate for wear of the cutting operations on the shearing edges.

After the rubber thread is severed from the tube, it is conducted to and wound on a spool, friction means being provided to accomplish this winding operation, and automatically operable means being provided to insure the winding of the thread upon its spool in level layers.

Special cutting means are described in the Bommer patent 1,788,615, January 13, 1931. The cutting instrumentalities comprise a rotary knife adjustable to desired position with relation to the roll of rubber from which it is desired to cut a thread, and also angularly adjustable relatively to the surface of the roll. Cooperating with the rotary knife is a second knife arranged at a predetermined spaced distance from the rotary knife; the second knife is fixed and has a cutting edge adapted to sever a thread from the roll, the sides of the thread having already been severed by the rotary knife during rotation of the roll. This fixed knife is also adjustable with the rotary knife, relatively to the roll, to sever a thread of any predetermined thickness.

The rotary knife is angularly adjustable, relatively to the surface of the roll and relatively to the fixed knife, to form a thread of predetermined width. These two knives: viz., the rotary knife and the fixed knife, are movable in unison progressively along the roll, the severing of thread forming operation taking place as the knives move along the roll.

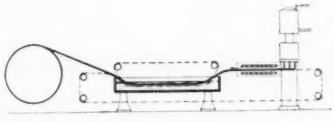
The rotary knife is adapted to penetrate into the rubber stock to a depth greater than the thickness of the rubber thread to be formed from the stock; the fixed knife performs the severing operation at a predetermined depth for the particular rubber thread being formed.

Extruding Rubber Thread

A continuous process of making rubber thread by extrusion is described in patent 1,528,537, March 3, 1925, to Draemann. A solution of rubber is extruded in filament form onto a conveyer belt which first passes through a drying chamber to evaporate the solvent and then through a molten bath of sulphur in order to vulcanize the filaments.

Another Draemann patent, No. 1,528,-

[1]Continued from INDIA RUBBER WORLD, Oct. 1, 1931, pp. 59-60.



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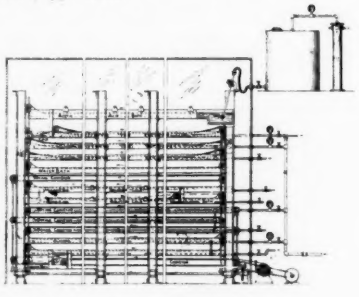

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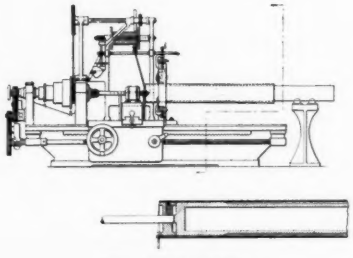

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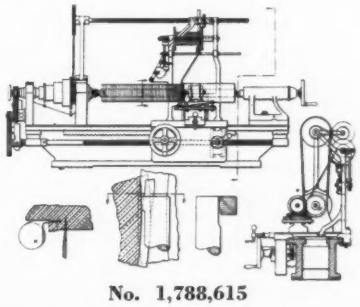


No. 1,788,615

538, March 3, 1925, treats a rubber solution with hydrogen sulphide and then extrudes it into filaments. The filaments are then subjected to the action of sulphur dioxide in order to vulcanize them.

Rubber Thread from Latex

The Hopkinson U. S. Patent No. 1,545,257, July 7, 1925, covers a process of making rubber thread by forcing latex through an orifice and changing the stream of latex into a solid rubber mass.

In carrying out the process for manufacturing lengths of thread latex having a moisture content of 50 per cent or more, preferably approximately 45 per cent (solid content of 55 per cent) is forced continuously by air pressure from the supply tank through circular orifices of nozzles. As the latex streams meet the coagulant in the tank, threads are formed continuous with the streams containing solid constituents of the latex. Each coagulated thread is continuous with the extruded latex, and at the position where it meets the coagulant, the stream is formed into a cohesive rubber mass having approximately the shape of the stream of latex at that position which is approximately that of the orifices in the nozzles.

The shape and the size of the thread may be varied by varying the contour and the size of the orifice, by varying the depth of the nozzles below the surface of the acetic acid, by varying the specific gravity of the coagulant, and by altering the rate of withdrawal of material through the orifice. In the preferred method the orifice for the thread is round and approximately .05-inch in diameter, and latex butter having approximately 55 per cent rubber content is forced into the coagulant and is withdrawn at the rate of approximately 20 feet per minute by the rollers over which the threads pass.

The nozzles are held below the surface of the liquid a distance varying from a fraction of an inch to several inches, depending on the size of the thread which is issuing. It has been found in practice that it is advantageous to immerse the nozzles to a greater depth as the diameter of the thread is increased.

The preferred coagulant is a 10 to 25 per cent aqueous acetic acid solution, on the surface of which the issuing thread floats and passes along through the tank supported by the liquid. By varying the specific gravity of the coagulant the size of the thread may be varied and it may be caused to sink in the coagulant. For example if alcohol having a low specific gravity is used, the issuing thread issues and drops by gravity much more rapidly and produces a smaller thread than where the solution is of the same density approximately as the thread itself.

At the beginning of the operation the flow of latex starts through the nozzles before submersion into the coagulant to prevent the entrance of the liquid into the orifice. The latter is then placed in the same position beneath the surface of the coagulating liquid. Coagulation of the issuing drops of liquid immediately occurs, the coagulum commonly adhering to the outside of the tube. A spring clip or similar device on each nozzle is preferably provided, and the small lumps formed on each nozzle upon dipping into the coagulant are grasped by the spring clip and drawn along; the thread attached to the lump follows at the desired rate, and this thread is then led to the roller over which it passes. The angle made by a plane passing through the longitudinal axes of the nozzles should be considerably less than 90° with the surface of the liquid. The angle should be such that the thread will issue into the liquid and continue moving through it for a short distance without change in direction in order to prevent distortion or wrinkling.

The thread then passes into the cold glycerol trough in order to combine, in the cold, with any acetic acid and water still contained in the thread. From this cold glycerol trough the thread passes into the trough containing glycerol heated to 100-120° C. which deprives the thread of some of its moisture and acetic acid. After passing through troughs containing glycerol heated to 125-145° C. where the final traces of moisture and acetic acid are removed, the thread passes into a water bath, where glycerol is removed therefrom, thence passing on to a drying conveyer where water absorbed in a water bath is eliminated.

From the drying conveyer the thread then passes into troughs containing vulcanizing solutions consisting of 5 parts by weight of zinc butylxanthogenate, 5 parts by weight dibenzylamine, and 2 parts by weight of sulphur dissolved in 100 parts by weight of benzol containing 20-30 per cent of carbon tetrachloride. Carbon tetrachloride is used to increase the specific gravity of the benzol and to decrease its inflammability.

Upon leaving the vulcanizing solution the thread which has been impregnated by the vulcanizing ingredients passes into an alcohol trough to harden the thread and make it more easily handled. The thread then passes on to the drying conveyers, which are heated approximately to 30° C. There the alcohol and the solvent for the vulcanizing ingredients are driven off, and the thread passes into glycerol baths heated to 140-150° C., where sufficient vulcanization is given the thread so that it may be wound up without change of form and stored to complete vulcanization. After leaving the glycerol bath the thread is washed in a water bath to remove water soluble constituents of the latex and dried on a drying conveyer whence it passes to the wind up roll.

Where the vulcanizing ingredients are mixed with the latex in concentrated form, various mixtures may be used. A preferred mixture is as follows: 100 parts rubber as concentrated latex (containing 55 per cent solid content), 1 part tetramethylthiuramidisulphide, 2 parts zinc oxide, 3 parts precipitated sulphur. The preferred method of preparing this mixture consists in mixing the ingredients to be added to the latex with enough concentrated ammonium hydroxide to give a paste and then stirring this paste into the latex. This mixture will vulcanize in approximately 10 minutes at 150° C. or in about 40 minutes at 100° C. The time for vulcanization will vary in accordance with the vulcanizing ingredients employed. If, accordingly, the mixture mentioned is subjected to this temperature for the length of time indicated, while passing through the machine, substantially complete vulcanization may be effected. If, on the other hand, a shorter period of time, say 20 minutes, is allowed for passage through the machine at 100° C., vulcanization will begin during such passage, and with the vulcanizing ingredients mentioned will complete itself in approximately 2 weeks upon standing at ordinary temperature.

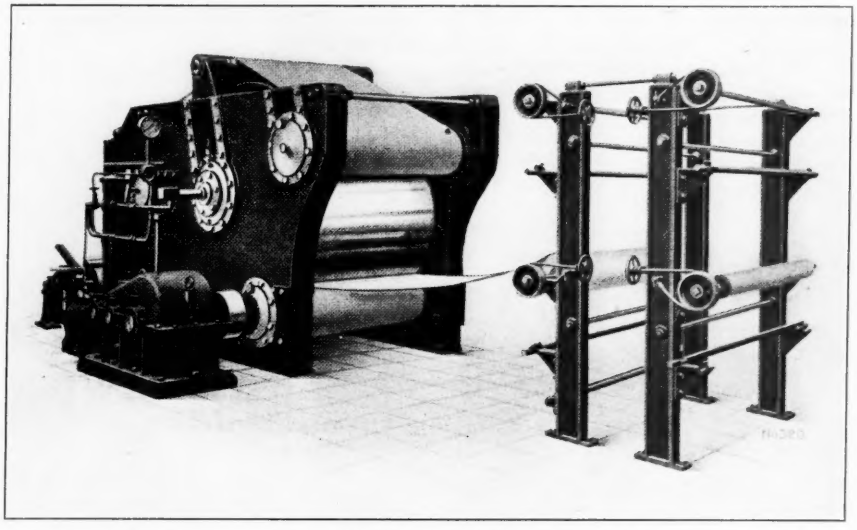
Edison's Last Experiment

AMONG the wide range of problems, the last that engaged the interest and inventive genius of Thomas A. Edison was the discovery and extraction of rubber from plant growth native to the United States. In his laboratories at West Orange, N. J., and Fort Myers, Fla., Edison devoted years of experiment to the study of the problem. Fortunately his efforts were successful, and a few weeks before his death he was gratified to receive from his laboratory concrete evidence of his final success in the form of a vulcanized sample of rubber from a species of golden rod grown in Florida, extracted, refined, and vulcanized under his supervision.

The success of Edison's experiments in respect to a new source of crude rubber is without practical significance in the rubber industry at the present time. What value it may hold for the future cannot now be foreseen.

Continuous Vulcanizing Machine . . .

Uninterrupted and Rapid Vulcanization of Rubber Products in the Form of Sheets, Strips, Bands, and Spread Coated Fabrics



Berstorff Continuous Pressure Vulcanizing Machine for Rubber Goods in Rolls

THE desirability of curing roll lengths of sheet rubber goods continuously and under pressure has long been evident, but practical solution of the problem has hitherto fallen short of satisfactory accomplishment. Resort naturally was had to a steam drum machine to apply the heat required; while the pressure was desired by means of an endless vulcanized rubber band or belt conveyer passing around the steam drum under tension, conveying and compressing the goods in their passage over the heated drum surfaces. Such pressure bands, however, proved only a makeshift because the prolonged temperature of vulcanization and the tension exerted caused premature destruction of the band. Also it soon became apparent in practice that the vulcanized joints of the bands weakened as a result of the high tension to which they were exposed. It was thus possible to apply only comparatively low and ineffectual pressures. The machine was adopted, therefore, only for vulcanization of rubberized fabrics and thin rubber sheets as it would not vulcanize thiek rubber sheets such as floor coverings, belting, etc.

Steel Pressure Bands

The merits of the continuous method involved in the earlier drum and pressure band machine justified its further development and the replacement of the rubber conveyer pressure band by one of steel. The accompanying illustration represents the improved machine supplemented by a take-up or stock stand.

The steel pressure bands are made full width of the drums and stand a tension approximately equivalent to the pressure obtained by an hydraulic press. The vulcanizing machine is built correspondingly strong.

The drums of the machine are finished according to the surface desired on the product. The machine drums may be highly polished or suitably engraved with the designs to be impressed on the vulcanized material. In addition they are specially prepared in order to prevent adhesion of the material. They are mounted in strong frames of cast steel, and the bearings are so arranged that the drums can be speedily changed without removing the pressure band. Whereas in machines of earlier construction, tension of the band was produced by spindles and handwheels, in the improved machine, hydraulic cylinders have been substituted. As a result any desired pressure can be obtained according to the kind of material. This pressure can be kept absolutely constant, which is essential to insure uniformity of the vulcanized material. For this purpose the machine is equipped with hydraulic pump. Also an asbestos band is introduced under the pressure band to insulate heat radiation and increase the rapidity of vulcanization. The vulcanizing drum is supplied with a suitable heating device and an automatic temperature regulator in order to render the functioning of the machine as independent as possible of the operator.

Scope and Capacity

The machine is driven by an electric motor of 2-3 hp., which can be regulated within wide limits to adjust the speed of the drum to suit the curing conditions of the rubber.

Besides the take-off stand in front of the machine for holding the unvulcanized material, a winding-up device is

arranged behind the machine so that the vulcanized material can be rolled up with uniform speed.

The field of application for the vulcanizing machine is very broad as the conditions of pressure can be adjusted to suit any material. It is, of course, requisite to compound the rubber mixings with ultra-accelerators that the curing time may be as short as possible, thus increasing the efficiency of the machine. Among the roll goods vulcanizable on this machine may be mentioned; floor coverings, up to a thickness of 6 mm., with smooth as well as with patterned surface; runners with plain or patterned surface; sheet for soling; packing in sheets; repair material in sheets; sponge rubber in sheet; transmission rubber belting; rubber conveyer belts; weatherproofed materials; hospital sheeting; fabric for collapsible boats; and automobile topping.

It is possible, furthermore, to vulcanize floor coverings made of different compounds. In this case and also in the case of material for collapsible boats and the like, the machine can be utilized for doubling the goods. In such instances, therefore, the operations of doubling and curing are carried on simultaneously. Rolls sufficient in number to meet these requirements are carried on the take-off device.

The machine is fitted with drums having diameters of 700 to 1,500 mm. and for widths of material to be worked, up to 2,000 mm. The output of the machine depends on the time of vulcanization as well as on the diameter of the drums and the breadth of the machine. The following may serve as examples: with a drum diameter of 700 mm. and a vulcanization period of 10 minutes, 8.64 m. are vulcanized in an hour. With a vulcanization period of 6 minutes an output of 14.4 m. is obtained. With a drum diameter of 1,500 mm., width of the work of 2,000 mm., and vulcanization period of 6 minutes, an output of 68 sq. m. per hour is secured.

The economic advantages of the machine are evident. If necessary, one worker can serve 3 machines, and in this way the cost of labor is considerably reduced. The consumption of steam is considerably lower than in the case of an hydraulic vulcanizing press since the drums are continuously under pressure and heat; whereas in an hydraulic vulcanizing press every time the press is emptied or charged, cooling takes place, necessitating reheating with large quantities of steam. It is especially to be noted, however, that vulcanization by the machine is absolutely uniform. On the hydraulic press, on the other hand, it is well known that irregularities of cure may very easily appear because the heating is always only periodical.

Economy

The great economical advantages of this machine are evident in comparing it and an hydraulic press in manufacturing floor coverings. It has been established that, leaving aside interest and writing off of capital, the wages and the expenses per sq. m. of floor covering in the case of the vulcanizing machine are only 1/10 of the sum required when an hydraulic press is used. It should be noted that the cost of the vulcanizing machine is much cheaper than a heavy hydraulic press adapted for handling the same output of goods. The machine will find a wide use in the rubber industry because of its economy of operation.

Sunken Type Stamp Molds

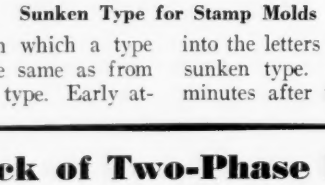
THE ordinary rubber stamp is made by curing a strip of stamp rubber clamped into a plaster mold or matrix cast from ordinary printing type. This method has long been in common practice but lacks the essentials of economy and speed attained by the latest method based on the use of sunken type.

Sunken Type for Stamp Molds

Sunken type represented in the illustration serves as the matrix or mold from which a type printing rubber stamp can be produced the same as from the usual plaster mold made from ordinary type. Early attempts to utilize sunken type for the direct molding of rubber stamps resulted in failure and abandonment of the method because air trapped on the matrix rendered the stamp defective and useless. The simple expedient of venting the individual sunken type made the method completely successful. Elimination of the air also makes it possible for the rubber to be forced into the letters with less pressure, causing no damage to the sunken type. Vulcanized stamps can be obtained in 10 minutes after the type has been locked in a chase.

Comback of Two-Phase Rubber

LONG cherished as seemingly an adequate explanation of the elasticity and other unique properties of rubber, the two-phase system got a jolt a couple of years ago on the announcement by Hauser that, when rubber is stretched sufficiently, it diffracts X-rays like fibrous material, which phenomenon could only be accounted for by the unwinding of spiral molecules. The two-phase system apparently was therefore superfluous, and seemed doomed to the limbo of untenable theories.



Rubber Latex Particle
50 Million per cu. mm.

Now the two-phase system of sol and gel is being stoutly defended and may stage a strong comeback. Acken and Davey declare that X-rays, instead of disproving, afford direct evidence of the validity of the two-phase system. They have found that the fiber structure, as revealed by X-rays, is not produced simultaneously with the act of stretching but requires a time interval to build up. Such time lag, they claim, can be accounted for best by assuming a two-phase system in which coiled molecules would represent the gel or beta phase, while the sol or alpha rubber would occupy the space within the coils and would have to be squeezed out to the interfiber spaces before the molecules of stretched rubber could aline themselves into true fibers.

In researches on the nature of vulcanization Pummerer and Pahl not only found evidence of the existence of a two-phase system but observed a difference in the solubility of sulphur in each phase. Thus total rubber vulcanized more rapidly than either the sol or gel modifications separately.

The two-phase system is shown in the diagram: an outer stabilizing layer of hydrated protein in contact with the water, the solidified skin of gel or rubber membrane underneath, the honeylike sol rubber within the particle.

Masking Tape

Special Adhesive Rubber Tape with Paper Base Essential in Spray Painting Automobile Bodies

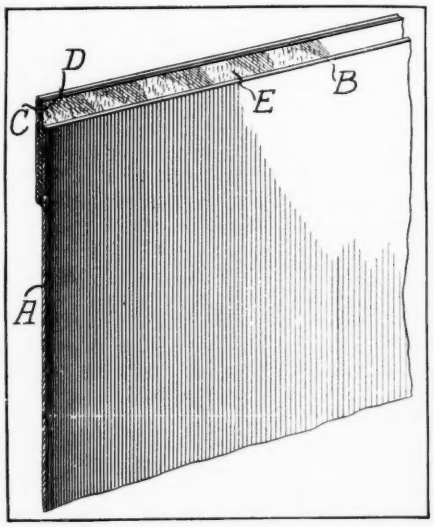


Fig. 1. Diagram of Construction and Application of Masking Tape

SMART automobile designs often call for two-tone effects or pencil stripe finishings, in different hues from the body proper. These colors, applied by the modern method of spray painting, necessitate exact work aided by means of cheaply and easily masking from contact with the paint all those areas where color is not wanted, such as glass windows, upholstery, rubber mats, running boards, bright metal parts, and sections where another color is to be used.

The masking of these surfaces is effected by a special adhesive material commonly known as masking tape, which must be flexible and proof against the penetration of liquid. Neither ordinary zinc oxide rubber adhesive tape nor gummed paper tape is satisfactory because both are not only difficult to remove but also leave on the covered surface some of their adhesive, which in being removed tends to mar the finish of the underlying area. Now, however, is available a patented adhesive tape[1] that eliminates these objectionable features.

Construction

In this tape, paper serves as a base, paper toweled, crimped, or otherwise shaped to present other than a flat surface and with an extensibility beyond that of the flat paper web. This paper is specially treated with a glue-glycerine solution to render it impermeable to such coating materials as lacquers, paints, and varnishes.

Such paper may have directly applied to one surface a water insoluble, non-drying adhesive, preferably energizable or active merely by applying pressure, like so-called zinc oxide or rubber base adhesive for surgeon's or industrial tape. This adhesive material may comprise 10 pounds of plasticized first quality plantation rubber such as clear crepe or smoked sheets, 2 pounds of cumaron gum or resin, and ½-pound of zinc oxide pigment.

These ingredients are compounded on a rubber mill to a plastic condition and then cut to a desired consistency, using a rubber solvent such as benzol, or a petroleum solvent such as high test gasoline.

The DeVilbiss Co., Toledo, O.

Fig. 2. Spray Painting with Masking Tape

Another compound includes 2 pounds of plantation rubber, 5 pounds of Guayule or wild rubber high in natural resin content, 1 pound of zinc oxide pigment. These also are compounded on a rubber mixing mill and then cut to the desired consistency, based upon the necessary viscocity for spreading this material.

Solvents

Ordinarily in both examples the solvent is calculated by the number of pounds of solid compound in 1 gallon of solvent such as, for instance, 8 pounds of solid or compounded material and 1 gallon of benzol, commonly referred to as an 8-pound cut. The variations in proportions of solvents added will depend upon the desired thickness of adhesive coating required in the residuum.

The resinous component also may be varied in its characteristic reactions to solvents by choice of the resinous material. Thus, to remove the adhesive from a body to which it may be applied it may be made soluble to various organic solvents, as benzol, gasoline, acetone, or alcohol. So, where a surgeon's tape is desired, which is soluble in alcohol, an alcohol soluble resin is added in the aforementioned examples.

[1]U. S. Patents Nos. 1,760,820, May 27, 1930, and 1,814,132, July 14, 1931.

Such a resin may be Burgundy pitch, which will allow using alcohol to remove a piece of adhesive tape from any surface, as from the skin of a patient, by soaking in alcohol the backing of the tape. The rubber, in any event, merely acts as a vehicle for the resin, and the character of the adhesive in its reactions to solvents will depend upon the character of the resin incorporated with the rubber.

The rubber resin compounds in their solvents may be spread upon the paper backing directly, using a knife spreader to distribute equally and uniformly this material upon the base. The solvent later may be evaporated, preferably without recovering it, and leaving the rubber mixture upon the paper backing.

Coatings

Though the rubber in its solvent may be directly put upon a paper backing, especially craft or white paper, it is advisable preliminarily to treat the paper with sizing, priming, or separator coats. It is preferred to treat one side of the paper with a rubber primer and the opposite side with a rubber finisher and then apply the rubber adhesive to the side of the paper first treated with the primer.

This is preferably a very light solution of rubber which will leave a very thin residue of tacky rubber to make the adhesive coating more amenable to adhesion with it. An example of this primer follows: 100 parts by weight of milled plantation rubber and 7½ parts by weight of phenosulphonic acid. This combination in sheet form is subjected to an oven temperature of 135-140° C. for about 6 hours.

The rubber finisher is preferably a solution of rubber which will leave a modified rubber deposit, such as chlorinated or vulcanized rubber, thus leaving a residuum of rubber which is non-tacky and non-adherent to the touch of a hand or, when stacked or rolled, will be capable of separation from the adhesive face.

The following serves as a rubber finisher. Plantation rubber dissolved in a suitable solvent, such as benzol, is placed in an agitator into which flows a small stream of chlorine gas. The temperature is checked by artificial refrigeration, and the chlorine treatment continued until the rubber solution becomes about 55 per cent chlorine saturated. Beyond this point free chlorine escapes, which condition is undesirable.

Advantages

The specially treated paper and its adhesive coating duplicate results attainable heretofore only with cloth backing and in addition have marked advantages over the latter. The paper base adhesive tape produces a flexible sheet having more body and density than cloth. High tensile strength is procured by loading the paper with glue, especially when acted upon by an insolubilizing, tanning, or formaldehyding agent, which renders the glue incapable of dissolving in water. This condition permits it to retain much of its strength when in contact with water and hygroscopic materials of which the adhesive film may consist. When glycerine or other modifying elements are utilized, the saturated sheet is very flexible and resistant to breaking by bending.

Then, too, the saturating and the coating serve to weld, vulcanize, or glue together the paper fibers into one solid sheet, making it impossible to laminate or split the tape when removing it from a surface or when put up in rolls without slip sheeting. This saturating treatment also makes impossible any surface fibers breaking or tearing away from the backing and sticking to the adhesive film when unwound from a roll. Thus no modification of the adhesive film is effected.

As the hygroscopic agent, such as glycerine, retained in the saturated paper maintains a water content in the paper backing of which it is a part, the adhesive film is prevented from anchoring itself too securely to the reverse side of the backing; for a non-drying adhesive sticks much more thoroughly to a dry surface than to one moist or damp. Because, furthermore, the glue saturated paper has been insolubilized, tanned, or formaldehyded, the adhesive coating will not unite with the backing since there is no solution possible between the rubber base adhesive and an insolubilized gelatin.

Paper is cheaper than cloth and does not stretch. The former material enables the user to preserve it for striping, etc., painting or finishing operations. Being relatively thin, moreover, the paper base permits sharper definition in a painting job of two or more colors. The edge of a paper backed adhesive tape has no feather edge, nor will it unravel.

The paper backing with an adhesive layer at its edges has the covering capacity of the full width of the paper but with minimum adhesion, permitting an economy in the adhesive coating, a ready removal from the body to which it is applied, avoiding the danger of marring the underlying surface. This tape may be unrolled or separated with great facility from an adjacent sheet, and, in general widens the field of utility due to cheapening the cost of the entire article.

Illustrations

Figure 1 is a diagrammatic perspective view illustrating the construction of the adhesive tape and the manner of applying it to the edges of a sheet of paper to be used as a painting mask. The latter, of course, can be cut to any desired size or shape to cover a given area.

In explanation of Figure 1, *A* is a masking sheet at the edge, *B*, of which a strip of the special tape *C* is secured by its adhesive coating *D*, that attaches only by pressure against the back of the masking tape *C*. As shown in the illustration, a narrow strip, *E*, of adhesive coating projects beyond the edge of the mask *A* and acts to hold the latter in place on the job.

The method of employing masking tape in spray painting an automobile is shown in Figure 2. It will be noted that all glass surfaces are protected and also the body color adjacent the areas where the operator is applying the paint spray. The device used is a spraying nozzle operated by compressed air which atomizes the paint as it forceably applies it as a mist where directed. It is clearly evident that the masking tape is an important factor in reducing the cost of automobile finishing by the paint spraying method, also by facilitating the work and eliminating skilled labor to a marked extent.

Achieving Sustained Prosperity

IF BUSINESS peaks and dips are to be leveled even approximately and general prosperity given a longer lease of life, certain fundamentals must be given more earnest consideration, says Magnus W. Alexander, consulting engineer for the General Electric Co. and president of the National Industrial Conference Board since 1916. In reviewing industrial ills and remedies, we are reminded, for example, that marked improvement cannot be secured unless the evil of excessive speculation be sharply curbed; that production must be restricted to reasonably anticipated demand; that anti-trust legislation should be liberalized to allow of combinations to check disastrous competition and to stabilize trade without public detriment; that over-expansion of capital investment, the pernicious effects of which are more lasting than even over-production, must be prevented; and that individual spending beyond income, needless bond issues, and other waste of tax money must be repressed. Yet over-saving is deprecated as an influence much more baneful in retarding normal industrial expansion than is generally realized.

Standard Specifications

for

Rubber Gloves for Electrical Workers on Apparatus or Circuits Not Exceeding 3,000 Volts to Ground[1]

A.S.T.M. Designation: D 120-23[2]

SPECIFICATIONS

1. THESE specifications cover electrical workers' rubber gloves of two classes: A. Gloves intended for use without external protection. B. Gloves intended for use with external protection of leather or other material.

Manufacture

2. The gloves shall be made by the "dipping" process, of high-grade rubber or rubber compound properly vulcanized, and shall be reversible. Unless otherwise specified, cuff edges shall be finished with a roll.

Physical Properties and Tests

3. All tests shall be made in accordance with the methods described in Sections 15 to 26, inclusive.

(A) Electrical

4. (*a*) Each glove shall withstand an alternating potential of 10,000 volts (r.m.s. value) for 3 minutes without showing a leakage current of more than 10 milliamperes (total current) at any time during the test.

(*b*) Each glove shall be capable of withstanding the application of the following voltage (r.m.s. value) for one minute without showing a leakage current in excess of that given below:

Class	Volts	Milliamperes
A	16,000	18
B	14,000	14

(B) Mechanical

5. A standard test specimen cut from any glove shall have the following physical properties:

(*a*) The tensile strength shall not be less than 1,200 lbs. per sq. in.

(*b*) The total elongation at rupture shall be not less than 500 per cent in 2 in. (2 in. stretched to 12 in.).

(*c*) The set following a stretch from 2 to 12 in. shall not exceed 0.7 in.

Standard Sizes and Dimensions

6. (*a*) The size of each glove shall be as specified subject to a permissible variation of $\pm\frac{1}{4}$-in. and shall be expressed in inches as measured around the palm at the base of knuckles.

(*b*) Unless otherwise specified, the length of each glove from the tip of the second finger to the edge of cuff, shall be 14 in. subject to a permissible variation of $\pm\frac{1}{2}$-in.

7. The respective thicknesses of the two classes of gloves in in. shall be within the following limits:

Class	Part of Glove Other Than Crotch		Crotch	
	Maximum	Minimum	Maximum	Minimum
A	0.065	0.050	0.065	0.038
B	0.050	0.030	0.050	0.022

[1] Under the standardization procedure of the American Society for Testing Materials, these specifications are under the jurisdiction of the A.S.T.M. Committee D-11 on Rubber Products.

Workmanship and Finish

8. Gloves shall be free from patches, blisters, pinholes, cracks, protuberances, embedded foreign matter, or other physical defects which can be detected by thorough surface inspection.

Marking and Packing

9. Unless otherwise specified, each glove shall be marked with the manufacturer's name and the size of glove. Such marking shall be confined to the back of the glove and shall be so done as not to injure the glove. Indelible and non-conducting ink shall be used.

10. Each pair of gloves shall be packed in an individual stiff paper box of sufficient strength properly to protect the gloves. The end of the box shall be marked with the glove size and in the case of Class B gloves with the words "For use with Protectors."

Guarantee

11. The manufacturer shall replace, without cost to the purchaser, gloves which at any time within a period of 8 months from the date of initial test fail to pass the tests herein prescribed, provided the gloves have been properly stored[3] in their original boxes.

Inspection and Rejection

12. Inspection and test unless otherwise specified shall be made within two weeks of receipt by the purchaser at his own expense at such place as he may designate.

13. (*a*) Each glove that fails to meet the requirements of Sections 4 (*a*) or 8 shall be rejected. In the case of gloves failing to meet the requirements of Sections 6, 9, and 10, rejection is optional with the purchaser.

(*b*) If any of the measurements of thickness made as prescribed in Section 16 or any additional measurements which the purchaser may elect to make fall below the minimum thickness specified in Section 7, the glove shall be rejected. If any of the measurements exceed the maximum thickness specified, rejection is optional with the purchaser.

(*c*) If rejections under Paragraphs (*a*) and (*b*) exceed 25 per cent of the shipment, the whole shipment may be rejected without further tests.

(*d*) If 50 per cent or more of the gloves subjected to the test prescribed in Section 4 (*b*) fail to pass the test, the entire shipment shall be rejected.

(*e*) If the average of the results for either the tensile strength, elongation or set tests made as prescribed in Section 26 fail to meet the requirements of Section 5, the entire shipment shall be rejected.

14. All rejected material shall be returned to the manu-

[2] These specifications are issued under the fixed designation D 120; the final number indicates the year of original adoption as standard or, in the case of revision, the year of last revision. Issued as tentative, 1921; adopted in amended form, 1923.

[3] "Proper storage" is to be interpreted to mean that gloves are not to be stored directly above or in proximity to steam radiators or other sources of artificial heat. It is desirable that the ambient temperature be not in excess of 90° F. (32.2° C.).

facturer without being defaced by rubber stamp or other permanent marking, excepting gloves which have been punctured on electrical tests. These shall be stamped, punched, or cut to indicate that they are unfit for electrical use.

METHODS OF TEST

15. The order of procedure in testing rubber gloves shall preferably be as follows:[4]

(*a*) Inspection of inside and outside surfaces (see Section 8).

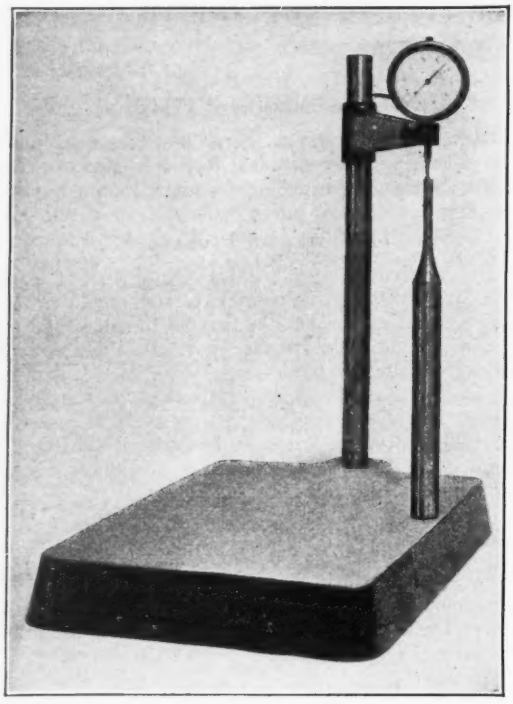


Fig. 1. Dial Micrometer

(*b*) Measurement of length (see Section 6 (*b*)).
(*c*) Measurement of size (see Section 6 (*a*)).
(*d*) Measurement of thickness (see Section 7).
(*e*) Electrical test (see Section 4 (*a*)).
(*f*) Dielectric strength (see Section 4 (*b*)).
(*g*) Mechanical test (see Section 5).

Dimensions

16. (*a*) The thickness of each glove shall be measured at not less than 4 points on the face and 4 points on the back.

(*b*) Measurements shall be made at one or more points in the crotch of thumb and index finger and in the crotches between the fingers.

(*c*) These measurements shall be made with any micrometer graduated to mils or tenths of mils having a ratchet friction or spring attachment. The tension on the friction attachment should be so adjusted that when the spindle has come to a stop, the specimen can be moved between the spindle and the anvil without causing any appreciable stretching of the rubber.

A dial-type micrometer graduated to mils and mounted in a manner similar to that shown in Figure 1 is particularly convenient for making all of these measurements, especially the crotches. The anvil is about ¼-in. (6.4 mm.) in diameter and the foot of the spindle about ⅛-in. (3.2 mm.) in diameter.

Electrical Tests

17. Each glove shall be tested for leakage in fresh water at normal room temperature (60 to 90° F.) by immersing in the water to within about 1½ to 2 in. of the edge of the cuff and filling with water up to the same point. The water inside of the glove and that outside the glove form the test electrodes. These are conveniently connected to the testing transformer by a chain suspended in the glove and by direct connection to the containing vessel.

18. The testing voltage shall be obtained from a testing equipment, no part of which has a testing capacity of less than ½-kva. per glove being tested. In no case shall the rating of any part of the testing apparatus be less than 2 kva. The frequency of the testing voltage shall be not more than 65 cycles.

19. The potential shall be applied at a low value and gradually and steadily raised at a rate of approximately 800 to 1,000 volts per second until the prescribed testing voltage is reached.

20. The test period shall be counted from the instant when the prescribed testing voltage is reached.

21. The method of regulating the testing voltage shall be one which does not distort the wave form of the testing voltage from a sine wave. Acceptable methods include:

(*a*) Field regulation of the alternator supplying the transformer;
(*b*) Induction-type regulator;
(*c*) Variable-ratio-transformer type of regulator;
(*d*) Potentiometer type of rheostatic control where the current in the portion of the potentiometer resistance in parallel with the primary of the transformer is at least 5 times the exciting current of the transformer.

22. The testing voltage shall be measured by one of the following methods:

(*a*) A properly calibrated electrostatic voltmeter connected directly across the gloves under test.

(*b*) Any properly calibrated commercial type of alternating current voltmeter connected to the low-tension side of the transformer in conjunction with the ratio of transformation of the transformer provided that the ratio is definitely known for all test conditions.

(*c*) A calibrated potential transformer with a voltmeter.

23. The leakage current shall be measured by one of the following methods:

(*a*) Directly, by inserting a milliammeter in series with each individual glove in turn.[5]

(*b*) By an ammeter in the low-tension circuit of the testing transformer. In this case the leakage current shall be determined by noting the decrease in the low-tension current when *one glove at a time* is disconnected from the high tension testing circuit, the voltage being left on the test circuit and the remaining gloves in the meantime. The difference in the two currents divided by the ratio will give the leakage current for the glove disconnected from the circuit.[6]

24. (*a*) One per cent of the gloves (in no case less than 2 gloves) which have passed all the tests previously

(*Continued on page* 60)

[4] This procedure has been found by experience to minimize the expense of the inspection and testing, particularly where an appreciable number of gloves fail to meet the requirements as to workmanship or dimensions.

[5] It is customary to make high voltage tests of this character with one end of the circuit grounded, the containing vessel usually being the grounded end of the circuit. The milliammeter should, therefore, be connected in at the grounded end of the circuit and shunted by a short circuiting automatic self-closing switch, which will, therefore, always keep the circuit closed except at the instant of reading and thus maintaining an uninterrupted ground.

[6] This method is inaccurate where only 1 or 2 gloves are being tested at a time because of the neutralizing effect of the leading current taken by the gloves on the magnetizing current, which is a lagging one. This effect is usually negligible with 3 or more gloves. The minimum number of gloves which may be safely measured in this manner is easily determined by noting the leakage current of a particular glove when tested with 1, 2, 3, etc., additional gloves, respectively.

Is Manufacture Direct from Latex Worth While?

S. D. Sutton, F.C.S., A.I.R.I., (Tech.)

THE number of patents taken out in connection with the preparation and the manufacture of rubber articles direct from rubber latex would indicate to the layman that the whole rubber industry is being revolutionized. It would seem that mixing mills, calenders, and vulcanizers are soon to be relegated to the museum, and rubber factories transformed into dairylike places with little or no heavy machinery. With these impressions in view it would be interesting to know how far have they materialized and what is the future of this new branch of rubber technology. Before these questions can be definitely answered, a survey of latex manufacturing problems must be given to clarify the matter.

U. S. Rubber Co.

Tappers Arriving at the Collection Shed with Their Buckets of Latex

It is well known that before shipment latex is preserved with ammonia on the estate, and it is here that many of the troubles experienced later in the factory can be avoided by the correct treatment of the latex. Manufacturers have learned to their cost that latex picked up on the market at random seldom gives the same result twice; so they now take care to purchase from estates which scientifically control the preservation.

In order to obtain a minimum of variation the freshly tapped latex should be taken to a central station and bulked into tanks capable of holding about 2,000 gallons, determination of the rubber content taken, and ammonia hydrate added. The minimum of ammonia should be used that will insure transportation to the factory without putrification setting in; this condition is a frequent cause of instability and premature coagulation. Various amounts of ammonia have been tried to determine the correct quantity, and it has been found that while a minimum of 0.75 per cent actual ammonia based on the rubber content can be safely added at certain seasons of the year and the latex will reach the factory in good condition, a chance exists that the serum substances at some periods will decompose more readily with the result that by the time the shipment reaches its destination a strong fishy odor is present, sometimes accompanied by coagulation. Experience has shown that 1 to 1.25 per cent ammonia content gives the best results, and thousands of gallons are shipped to Europe and the United States annually, the latex arriving in perfect condition.

For many years there has been much talk of the variability of raw plantation crepe and sheet, but this is in no way so great as the variability experienced in latex. The serum substances which are lost in the preparation of crepe and sheet remain in the latex and, although they have a marked influence on the aging of the rubber, they are subject to great variations. The season of the year, rainfall, location and soil of the estate, and even certain areas on the estate have been found to have profound effects on the latex, that would not be noticeable in rubber prepared by coagulation in the ordinary way. This fact is extremely important as the manufacturing operations later are liable to be affected by the variability in the latex. So far, bulking of large quantities has been the only solution to the difficulty, and some estates confine their tapping for shipment to certain areas; but this precaution does not prevent variability between each consignment. This problem is very acute just now as, owing to restricted tapping, many of the trees are not tapped so frequently as before and yield latex having a high rubber and serum content. As the usual requirement of the market is about 38 per cent dry rubber content, dilution of the latex is sometimes made during the bulking operation on the estate, adding another factor for variability.

The question of containers for shipment largely depends on the ultimate destination of the latex. Certain large users

ship in tanks specially constructed to transport latex, and on arrival at port of destination the latex is pumped into enamel lined vessels mounted on trucks for conveyance to the factories. It is, however, doubtful if this method will be generally adopted as transport to the ship in enamel lined tanks is necessary and latex is not easy to pump. Particles of coagulated rubber form, because of friction, and are liable to clog the pump. Collapsible barrels are also largely used, which hold approximately 40 gallons. These barrels are coated with latex which is allowed to dry and form a film of rubber before filling. This prevents rust and discoloration of the latex, and after the barrels have been emptied they can be dismantled and nested for returning to the estate. The kerosene tins, however, still retain their popularity, probably owing to the ease with which they can be obtained and handled.

Two tins each containing 4 gallons are packed in a case and as a rule arrive in the factory in excellent condition. There may be, however, a slight sediment at the bottom of the tin, which sometimes imparts a greyish shade to the latex. This sludge forms during transit because of partial decomposition of the latex and is generally accompanied by a fishy odor. Tins of latex so affected should not be mixed with the rest of the shipment but set aside for careful examination. The addition of one tin of this latex to the bulk, although coagulation is not noticeable, may cause serious trouble later in works operations.

The manufacturing difficulties associated with latex are so great that it is imperative that the latex in the initial stages should be as near perfection as possible.

Another important consideration is the high cost per pound of dry latex rubber as compared with crepe or smoked sheet. Latex rubber on an average costs nearly twice the market price of ordinary first grade rubbers; so it is important that there is a minimum of loss in the first stage of manufacture.

The introduction of concentrated latex has helped to solve the transport and the variability problems to some extent. Two processes of concentration have been developed on a large commercial scale, and the methods of packing effect a great saving in freight charges. Concentrated latex is obtained by direct evaporation; the latex is heated in a revolving drum, which is steam heated. A current of air is blown through to drive off the moisture, and a weighted roller immersed in the latex keeps the surface broken up preventing the formation of skins. To prevent coagulation during concentration a suitable protective colloid is added to the latex. The concentrated product is generally exported in plywood cases and has a rubber content of about 70 per cent. Concentrated latex as used in the industries has a consistency of very thick cream.

The other method used for concentrating latex is by centrifuging. This product has a rubber content, when exported, of approximately 60 per cent. It is shipped in drums containing 40 gallons and has a much lower viscosity than concentrated latex. The two methods of concentration yield entirely different products: the former contains all the serum substances and a protective colloid; while the latter method dispenses with part of the serum and needs only ammonia to insure its preservation.

As the packing used for shipment reflects on the ultimate cost of the rubber, the plywood case of concentrated latex is the cheapest form; drums are dearer, and tins the most expensive, a wooden case being additional to the tins.

The manufacturer has, therefore, to consider first the effects of the various properties of the three types of latex on his final manufactured product, and to weigh the advantages that may be obtained by the direct use of latex over ordinary crepe or sheet at the present low prices.

(*To be continued*)

Standard Specifications

(*Continued from page* 58)

prescribed herein shall be selected at random and tested for compliance with Section 4 (*b*) and also for ultimate dielectric strength. The tests shall be made in accordance with the general method described in Sections 17 to 23 inclusive. If the glove passes the test prescribed in Section 4 (*b*), the potential shall be raised steadily and gradually at a rate of approximately 1,000 volts per second until failure occurs, the voltage at failure being recorded.

(*b*) If any glove fails to meet the requirements of Section 4 (*b*), an additional glove shall be selected at random and tested.

Mechanical Tests

25. Four or more standard test specimens shall be cut from each glove tested under Section 24. The shape of these specimens shall be in substantial accordance with that prescribed in the Standard Methods of Testing Rubber Products (A.S.T.M. Designation: D 15) of the American Society for Testing Materials.[7] The essential dimensions of this sample are:

Total length: 6 in.

Width: 1 or 1¼ in. with a reduced section at the center, ½-in. wide and about 2 in. long with radii of curvature between the ends and reduced section of ⅞-in.

26. The tests for tensile strength, elongation, and set shall be made in accordance with the Standard Methods of Testing Rubber Products (A.S.T.M. Designation: D 15) of the American Society for Testing Materials.[7] The essential features of these methods are:

(*a*) Temperature of testing room and of specimens, between 65 and 90° F.

(*b*) Rate of separation of jaws of testing machine, 20 in. per minute.

(*c*) Tensile strength and elongation shall be made on one sample and set test on a separate sample.

(*d*) Set test shall be made by stretching the 2-in. gage length to 12 in., holding for 10 minutes and measuring the distance between the bench marks 10 minutes after release.

[7] 1930 Book of A.S.T.M. Standards, Part II, p. 1040.

Greater Evil Than Depreciation

ALL well-conducted manufacturing establishments discount plant depreciation. The best equipment must wear out in time, and usually fair provision is made for its replacement. But the same may not be said of an even greater evil than depreciation—obsolescence, a trouble not so easily diagnosed as the usual decline in usefulness of machinery. In fact it may be long in coming or it may strike almost overnight.

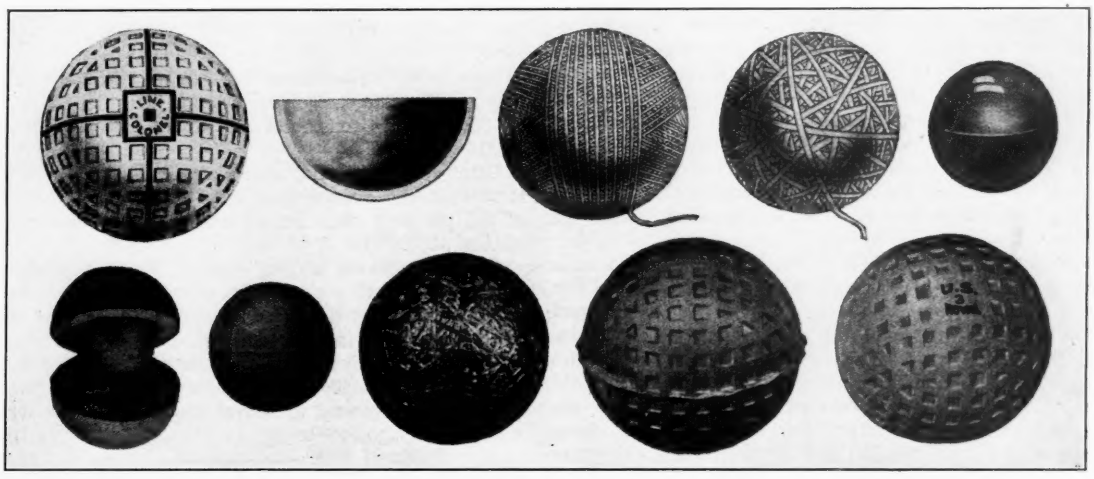
It may even take a depression to make some manufacturers realize the disadvantage in lack of up-to-date equipment. Especially are they unable to meet the reduced prices of more alert competitors. The latter at the outset of a slump analyzed their condition and discarded good but slow equipment and replaced it with machinery and processes that would yield utmost production with the least possible labor and materials.

There is no set rule for recognizing obsolescence. As one authority has well put it, when it can be demonstrated that new plant facilities will more than pay for themselves in lower operating costs or wider markets, present facilities can surely be regarded as obsolete.

What Makes a Good Golf Ball

Features With Which Users Should Be More Familiar–Significance of Core, Winding, and Cover–Makers Strive for Optimum Efficiency–Remade Balls Add to Game's Hazards

OF THE big army of golf "addicts" in this country it may be safely asserted that but a small percentage of the players really know what constitutes a thoroughly good ball. They buy balls on the advice of friends or dealers, or they find out what make of ball is favored by a leader on the links and then follow his choice implicitly. Not that most of them, like society in general, care little about processes and want only results, but information about golf ball construction and the dynamics of the parts in play may not be readily available. So they content themselves with general experience as to what balls may be depended upon to insure good average results off the tee, through the fairway, and on the green.



Progressive Steps in the Manufacture of Two Popular Golf Balls: Upper—St. Mungo "Colonel," Lower—U. S. Royal

Additional interest in the ball itself as well as the game has been aroused by the advent of the new standard ball, which, according to the ruling of the United States Golf Association, effective January 1, 1931, must measure 1.68 in. in diameter and weigh 1.55 oz. The larger, lighter ball is said to have been planned to reduce the average carry and roll by about 6 yds. on a 250-yd. drive and has necessitated in many cases radical changes in manufacture.

Of the scores of types of balls put on the market the most used are those having some kind of rubber pills or cores, about which are wound, uncompounded rubber tape, or thread, or sometimes fine pure gum small-bore tubing, and the whole covered with a gutta percha or balata rubber shell. The nature and the amount of such materials and the care bestowed in manufacture will, of course, materially affect the play of the golfer and the behavior and the durability of the ball.

The Resilient Core

While the heart of the ball is commonly a sphere of compounded rubber, sometimes it is a cellulose derivative filled with a rubbery paste. In fact some imported balls have true liquid cores to give the utmost mobility for flight. In some cases the core is a sphere of a balata compound or a combination of rubber and balata. Ordinarily the core is a molded sphere ranging from $1\frac{1}{2}$- to $1\frac{1}{16}$-in. in the higher grade of balls to as much as $1\frac{3}{8}$ in. in the cheaper variety. These differences are not hard to understand in view of the fact that good core making is relatively costly and price is an important factor in marketing. "Floaters" for water hazards are made with centers which are nearly pure rubber.

To insure perfect balance and proper response to a stroke it is essential that the cores be most accurately centered. Good manufacturers take the utmost precautions to have the outside of such cores equi-distant at all points from the balata or gutta percha shell. Even X-rays are now used to test centers. Balls found with even slightly faulty centers are sold as seconds.

The Elastic Winding

Over the innermost section is the tense winding of pure rubber tape, thread, or tubing. The tape may have a width of from $\frac{1}{16}$- to $\frac{1}{8}$-in. and be from 6 or 8 to 20 to 22-1,000 in. thick, the wider being on the inside and the narrower on the outside. A ball well wound and having an ample number of layers under sufficient tension has a high degree of resilience, provided its cover be of good material and not too thick.

Many sporty players like a ball that gives a good "click," such as is afforded by an extra hard-wound balata-covered ball. But the drawback with many balls that have a good "click" is that they are easily cut.

The common test for resiliency is to drop a ball on a tile or concrete surface and note how high it will "jump." A

cheap ball may at first have a good "jump" but it will soon lose it in hard play.

Composition of Cover

The cover stock, molded on the ball with heat and pressure, is of gutta percha, vulcanized rubber, or nowadays largely a balata composition that compares well with the toughest gutta.

Although it is claimed by some that too high a proportion of balata may induce aging and increase internal friction, it is, nevertheless, held that where the balata content is high in the coverstock, the speed of the ball is likewise high, and if well compounded and of proper thickness, it should be very durable.

A good golf ball should have a cover so tough and resilient as not only to enable the ball immediately to regain its spherical shape after being deformed by a blow, but also to withstand amply the strain put upon it by the core and its windings recovering from the compression to which the interior of the ball is subjected when struck.

Purpose of Patterns and Paint

The usual guess of a new player is that the raised or depressed markings on the cover of a ball are either for ornament or to prevent a ball slipping when struck. As a matter of fact the markings play a unique part in the mechanics of a ball in play. It is explained that the ball being a sphere, and as it can not be projected without giving it a spinning motion, the pattern is designed to break up the pressure bankings forming on the ball in its passage through the air. The patterns mostly familiar are the dimple and the mesh, each having its champions.

Many golf ball buyers believe that the only reason balls are painted is to make them more visible and attractive. But there is a more important reason, and that is a good coat of paint will, by reducing air resistance, actually increase the distance in flight. True, paint may cover up many imperfections on the surface of a ball such as mold pitting, buffing where the two sections of the cover are united, or chemical treatment. For the makers of cheap balls paint may be a blessing and for the buyers a disguise and disappointment.

While most balls are painted white, manufacturers are increasingly providing balls with dots of high visibility colors: red, blue, green, and maroon.

Trade in Second-Hand Balls

A surprisingly large and growing trade is being carried on in made-over golf balls. While about 18,000,000 new balls are said to be sold yearly in the United States, the sale of renovated balls is estimated to reach some 3,000,000 balls. Most of the latter are remade in this country, but a great many come from England. In fact, despite the high American tariff, it is said that 480,000 remade balls of one brand alone were sent here last year by British manufacturers.

It is stated that balls sold by caddies for 5 and 10 cents reappear in new guises and under new names at $3.50 a dozen after old covers have been stripped off and new ones substituted. Standard brands in fair condition are repainted and sold at $6.50 a dozen.

Dependable manufacturers urge players to take no chances on remade balls. Unlike an old tire they may not show their age, but long use will take its toll, and "fatigue" within and crystallization without will soon lessen the efficiency of a made-over ball.

Hence makers ask players: "Why buy a remade ball that may throw you off your game when for a trifle more you can get a new ball of good repute that will not fail you when you must have the utmost benefit from a game."

Industry and Trade

From Report of National Industrial Board

AUTOMOBILES produced in the United States and Canada in September are estimated to have totaled 142,600 cars and trucks. The month's output was 26 per cent under production in August; the monthly seasonal movement is a 7 per cent decrease. September production was 38 per cent under what it was a year ago. During the first 9 months of this year 2,196,129 motor vehicles were produced as compared with 3,047,752 for the same period last year, representing a decrease of 28 per cent.

Retail sales in the United States during the first eight months declined 27.2 per cent below sales for the same period last year. Motor truck sales decreased 23 per cent, showing a somewhat smaller drop than passenger cars which fell off by 27.6 per cent.

Consumption of crude rubber by manufacturers in the United States for the month of September decreased 14 per cent as compared with August. The usual seasonal decline is about 10 per cent. September consumption is estimated to be 23,638 long tons as compared with 27,586 long tons for August and 25,515 long tons for September, 1930.

Imports of crude rubber for August amounted to 40,505 long tons, an increase of 5.6 per cent over the August figure of 38,370 long tons, and 2.6 per cent above September, 1930.

Total domestic stocks of crude rubber on hand as of September 30 are estimated at 254,324 long tons, an increase of 5.6 per cent over August and 49.7 per cent over September 30, 1930.

Gasoline demand during August, 1931, indicates an increase in domestic consumption of 3.04 per cent, when compared with corrected figures for August, 1930, but a decline of 2.54 per cent in total demand, domestic and export.

Stocks of gasoline at refineries on October 1 are estimated to have been 34,250,000 barrels, a 4 per cent decrease from stocks on September 1 to a level 10 per cent under what they were a year ago.

Folly of Sacrificing Quality

ON THE death of an old American manufacturer whose belief in "Nothing but the best" had won him fame and fortune, his sons decided that he had been old-fashioned and that more money could be made by lowering quality and cutting prices. But soon after slipping the conservative moorings the business also started slipping. Old customers resented the change from a quality basis and bought from those that still had ideals; while rivals making goods carrying no assurance of service easily underbid the old concern. Finally a competitor bought the business for a song.

Many rubber manufacturers with enviable reputations for reliability have in the recent stress been strongly tempted to "let down" a little to meet temporarily increased demand for cheaper goods on an ebbing market. But that there has been no appreciable defection in this respect is very gratifying to the trade, and it is earnestly hoped that none will succumb to the reactionary pressure. They need not adopt "The Old Guard dies but never surrenders" motto, but they can safely refuse any compromise with mediocrity; and such action pays. The concerns that best weathered storms in the past were those that adhered to high standards and declined to risk their best asset, a good name, for a passing advantage. Brisk times must return, and the rubber manufacturers who have fought the good fight and kept faith will find their fortitude rewarded by consumers who can and will pay a fair price for dependable goods.

Rubber Thread Tester

David C. Scott[1]

UNTIL recently no suitable apparatus was available to manufacturers of rubber thread to test its physical properties. The difficulties encountered in the design and the construction of a testing machine suited to this purpose were considerable.

The small cross section of the specimens to be tested and the softness due to the high gum content of the material necessitated a specially designed machine, grips, and automatic recording attachment. S. H. Hahn and E. O. Dieterich, of The B. F. Goodrich Co.'s laboratories, devised a mechanism for testing rubber thread which they described in a paper read before the Division of Rubber Chemistry[2]. This machine was most ingeniously adapted for thread testing and consisted of a converted Scott cord tensile testing machine rebuilt to 5 pounds' maximum capacity and equipped with an autographic recorder of their own design and construction. They also devised a means for holding the test specimen, which proved very effective and admirable as a grip. The work of Hahn and Dieterich blazed the way for the testing machine manufacturer and demonstrated that satisfactory tests can be made on small rubber specimens. Further mechanical development of their apparatus has led to the production of the machine here pictured. Similar machines have been built for testing silk, rayon, fibers and fine wires.

The machine is constructed with an inclination balance or dead weight lever type of head usually ranging in capacity from zero to 5, and zero to 15 pounds. The head is extremely sensitive because of its novel construction and complete counterbalancing. It is also uniquely designed to produce a uniform increment of load. The gear box is of the constant speed of pull type driven by a small electric motor. The autographic recorder is of new design and uses rectilinear forms ruled with equal increments in the directions both of load and stretch. The stylus of the recorder is of the electric type in order to eliminate the friction usually caused by the contact of a marking pen against the paper. A commutator is incorporated in the gear box mechanism for operating the stylus and causing a spark to occur at every 1/10-inch of its movement. The point of the stylus is platinum. The small holes thus burned through the paper by this arrangement serve as a very legible and permanent record. The entire assembly of the stylus and its connections constitutes a counterbalance for the weight of the upper machine clamp, and the accuracy of the test is not impaired by its use.

A machine of this type must of necessity possess extreme accuracy as to tensile registration because the very large factors necessary for converting the test results into tensile per square inch greatly magnify the smallest error to the point where it becomes of considerable magnitude. The elongation direction of the chart is sufficient to allow recording 1,100 per cent elongation at break.

The machine is convenient for the operator and is of such character that special training or experience is not required for its successful use. Figure 1 represents the full assembly of the machine with motor belted to the pulley of the gear box. The test sample of thread is shown in place between the upper and the lower grips with the dynamometer at the top of the machine, and below it the chart of the electric autographic recorder.

Figure 2 represents the special clamp or grip used on this machine for holding the thread under test. The clamp is in the form of two half round pieces arranged to be drawn together initially and by the strain of the specimen as tension is applied. It is also feasible to use clamps of other design such as those made for holding specimens cut in the ordinary dumbbell form, rings, etc.

The convenience of having the original test record in stress-strain diagram form, computed to terms of tensile per square inch and elongation percent, is very great in tensile machines of larger capacity, and should prove of interest in this type. While the arrangement for automatic computation of the test of the specimen has not been incorporated in the apparatus, it is possible to embody it.

This machine is not standardized in every particular, but each is built special because of the variance of the requirements of each thread manufacturer or user while preserving the features of sensitivity, accuracy, and dependability.

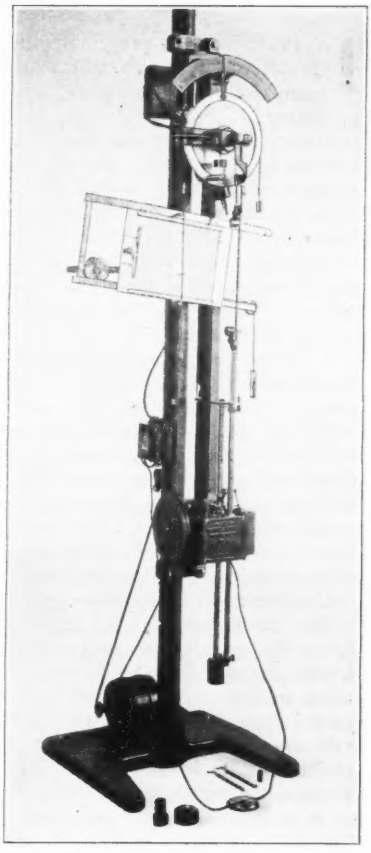


Fig. 1. Autographic Rubber Thread Tester

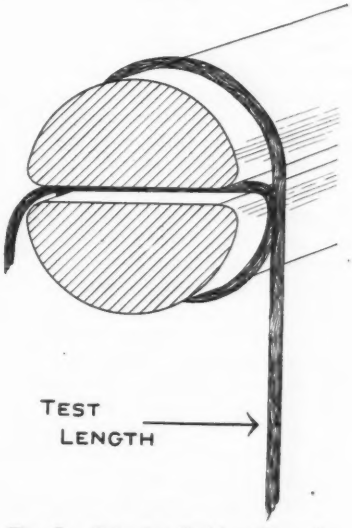


Fig. 2. Grip for Rubber Thread

[1] Henry L. Scott Co., Providence, R. I.
[2] Presented at the 80th meeting of the Amer. Chem. Soc., Cincinnati, O., Sept. 8-12, 1930. INDIA RUBBER WORLD, July 1, 1931, pp. 71-72.

Plantation Rubber

Past, Present, and Future

Clifford C. Johnston[1]

IN 1911, when its progenitor, fine Para sold for $2.85 a lb., it was little thought that plantation rubber, then comparatively a newcomer, would develop so rapidly as to destroy a few years later the popular conception that rubber below $1 a pound was cheap. So when the 85-cent level was reached, this price was referred to as "the lowest ever experienced in the history of the industry." Even in 1914 when plantation shipments exceeded the total output from forest trees and vines, there was no comprehension of the future phenomenal growth of the industry. This infant industry was hardly out of its swaddling clothes, however, before it had to face the economic interferences occasioned by the Great War.

A British embargo, which began late in 1914 and continued until 1917, prohibited rubber shipments from British plantations to any other port than London; and beginning with May, 1918, the United States Trade War Board regulated the imports of the commodity into this country. Plantation rubber produced exclusively in the Far East had to face the closing of the Suez and the Panama canals as well as the embargo of the Allies against German imports and a severe curtailment of consumption by Russia. These artificial restraints as to consumption were later to be followed by governmental interference with production.

The inauguration of the British restrictions in 1922 was followed by extensive anti-restriction propaganda in the United States during 1925 and 1926. By 1925 public interest in the commodity had been so aroused that a crude rubber exchange was deemed necessary to safeguard investment buying and manufacturing hedges. With the formation of this exchange in New York City plantation rubber attained the importance of other leading world commodities such as cotton, grains, and steel. In 10 years an infant planting industry has become one of the most important industries in the world.

The comparative newness of the industry, however, has made it difficult to anticipate correctly its price gyrations, and its market behavior has been aptly referred to as resembling the uncertain behavior of a red-headed schoolboy. For example, during the period 1917-1920, when every other commodity was rising in price, plantation rubber prices dropped considerably below the level of 1914. (Other commodities rose to from 2 to 3 times what they had been in 1914.)

An industry less than 35 years old can still be regarded as in its youth and subject to surprising developments, and it is not the purpose of this article to advocate or confirm current predictions that rubber price fluctuations will be confined to below 8 cents a lb. for many years to come. Such predictions disregard the facts: (1) that rubber is not an annual crop; (2) that it cannot be produced economically except in the tropics; (3) that the rate of return on rubber investments must be higher than for investments on commodities grown in parts of the world less susceptible to climatic and other disturbances; and (4) the likelihood of far eastern labor conditions undergoing considerable changes in the future.

Aside from these facts, the main factor that will make plantation rubber vulnerable to radical price changes in future years is the *immaturity* of the industry, as apparent from the following: (a) the average cost of producing plantation rubber is not yet accurately known; (b) the relation of plantation rubber to silver in the Far East is not generally known; (c) its total planted acreage has not been determined with any accuracy; (d) its culture is not yet practiced scientifically as a whole; (e) its method of preparation has been little altered since the industry came into being (with exceptions that will be noted); (f) its possible uses in the future are as yet far from being fully comprehended.

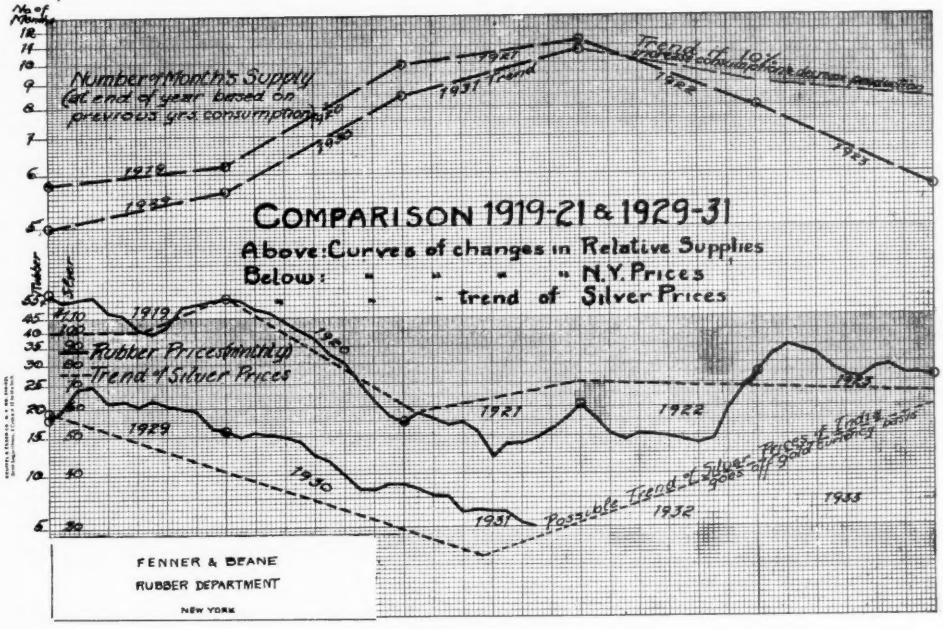
Costs of Production

From 1914 to 1918, 60 cents a pound was recognized by the United States Government as a normal level for rubber prices (War Industries Board Price Bulletin No. 30). Beginning with 1921, British restriction authorities decided upon 31 cents a pound as the basic price for the Stevenson Enactment. The imposition of British restrictions, however, caused a change in the American viewpoint; so by 1925 the United States Congressional Committee on Interstate and Foreign Commerce assumed that production costs of plantation rubber were not over 18 cents a pound. In 1926, however (after the Figart investigating committee had reported to the government), the United States Department of Commerce regarded 35 cents as representing a price fair to buyer and seller. In the meantime the British Colonial Office Committee directing the administration of the Stevenson Restriction Enactment raised the basic price from 31 cents to 37 cents a pound.

It was around the 35-cent level that the huge American rubber buying pool (made up of the leading tire and automobile manufacturers) purchased upwards of 50,000 tons during 1926, and it is reasonable to assume that this large buying movement was actuated by facts rather than fancies regarding the average costs of producing plantation rubber. It must be assumed that the United States Department of Commerce and what was perhaps the largest buying pool in the history of American industry did not regard a return of over 20 per cent to foreign planters as justifiable. Their estimate of production costs for 1926, therefore, was not less than 28 cents a pound. Deducting from this figure the rise of 6 cents in the basic price of the Stevenson Enactment above referred to would indicate a production cost of 22 cents in 1922. It will be recalled that the hue and cry of the rubber planters in 1921-22 was for "shilling rubber," and their demands are more or less justified by the above deductions.

If for 2 years beginning with November, 1920, plantation rubber sold at from 8 cents to 1½ cents a pound below estimated production costs (at a time when selling prices ranged from 14 to 20½ cents), it has been assumed by casual observers that the present slump of rubber prices to admittedly below average production costs must last for at least 2 years. Although the end of the 1920-22 slump in rubber prices was marked by the inauguration of the Stevenson Enactment, it is generally admitted that the reduction of the world's surplus from 11½ to 8½ months' supply during the 10 months of 1922, prior to the beginning of

[1] Rubber consultant, Fenner & Beane, 60 Beaver St., New York, N. Y.


COMPARISON 1919-21 & 1929-31
Above: Curves of changes in Relative Supplies
Below: " " " " N.Y. Prices
" " trend of Silver Prices
Number of Months Supply (at end of year based on previous yrs consumption)
Rubber Prices (monthly)
Trend of Silver Prices
Possible Trend of Silver Prices if India goes off Gold Currency basis
FENNER & BEANE
RUBBER DEPARTMENT
NEW YORK

the Enactment, was a clear indication that prices would have righted themselves by the end of 1922 without the help of restrictions.

A study of the accompanying graph is interesting in this connection. The two curves representing "Number of Month's Supply" for 1919-21 and 1929-31 are remarkably similar. Likewise there is a similarity between the two curves representing "Monthly Prices" for 1919-21 and 1929-31. It does not, of course, follow that the curve of prices during 1932-33 will resemble the curve for 1922-23. (The trend would have to veer upwards considerably during the last quarter of 1931 to synchronize with the 1921 curve. The trend of the supply curve is more sharply upwards so far during 1931; the price curve has been forced downward.) As, however, the supply curve is based on the past consumption rates, it is interesting to note the effect upon this curve that a 10 per cent increase in consumption and a 10 per cent decrease in production would have during 1932-33 (compared with 1931 rates).

On the graph there has been indicated the trend of silver prices and also the possible trend of silver prices during 1932-33 if India goes off the gold currency basis, which was only established in this country as late as March, 1927. Before further deliberations as to the future trend of rubber prices, it is appropriate at this point to give consideration to the seeming relation between silver and rubber prices.

Relation to Silver

It is reasonable to assume that some relationship exists between the metal that has for many generations been the measure of wealth for the great majority of natives in India and China and the commodity which, along with rice, is peculiar to the Far East. It must be noted, however, that the fluctuations in rubber prices have not always followed those of silver. During the transition period 1915-1919 rubber was severely hampered by artificial regulations, and the demands of war created a tremendous latent demand for silver in both India and China. (The depreciation of British exchange in 1915 created a large demand for silver from the Allies for coinage purposes, and during 1918-19 three billion ounces were shipped to India by the British Government. Just about this time the United States Government fixed a stabilization price for silver at $1.01—to be followed by heavy Chinese buying in 1919). The severe deflation in silver prices which began in December, 1919, and continued into 1921 had something to do with the radical decline in rubber prices that began in February, 1920, and continued for 17 months (during the last 8 months of which large estates belonging to the British Rubber Growers' Association were restricting their crops 25 per cent.) There is evidence to show that production costs decreased during this time, the demands for wage increases from Indian and Chinese coolies no doubt lessening with the decline of silver prices. (It is peculiarly characteristic of the Chinese coolie for him to make regular remittances of money to China for the partial or entire support of relatives just as it is peculiarly characteristic for the Tamil coolies to load his wife with silver ornaments to constitute "a tidy sum saved for a rainy day.") Silver authorities point to a rise in silver prices to follow the decreasing production of this metal; and if the supply curve is gradually forced downward by the eventual curtailment of rubber production, these two factors alone are bound to force rubber prices to a level at or above production costs.

What present-day production costs are is difficult to determine. As late as November, 1928, the British undersecretary of state estimated that the normal costs of production amounted to between 8 and 10 cents a pound in the Netherlands East Indies and from 14 to 18 cents in British Malaya, but he reported that the wide variation in costs and the absence of comprehensive data made it impossible to do more than guess at what constitutes the average or normal cost of production. Because some highly efficient estates have more recently reported production costs even below 6 cents a pound in British Malaya, the present-day costs are given out as 4 or 5 cents or some other low figure by estimators who are merely guessing. If silver prices are to advance in 1932 and 1933, it is of more importance to consider whether production costs for rubber will not also advance.

Total World Acreage

In an article entitled, "Native Rubber Situation in the Netherlands East Indies,"[2] the writer pointed out the in-

[2] India Rubber World, June 1, 1928, pp. 71-72.

consistencies between estimates of Dutch and British investigation committees as to planted acreages of native rubber in the Dutch East Indies. Whereas the actual 1927 export figures indicated a planted acreage in bearing of not over 350,000 acres and the London rubber growers estimated the same year that the total planted acreage did not exceed 500,000 acres (they admitted that their estimate was "purely conjectural"), the Dutch Native Rubber Investigation Committee estimated a total planted area of three times this figure (1,200,000 to 1,500,000 acres). A later field investigation under the auspices of the British R.A.A. (Tayler and Stephens, 1929) reported the area of native rubber producing as "not less than 347,000 acres." The total area planted was estimated according to them as follows:

	Old Acres	Young Acres	Total Acres
Pontianak	53,000	159,000	212,000
Bandjermasin	50,000	100,000	150,000
Palembang	53,000	265,000	318,000
Djambi	70,000	140,000	210,000
	226,000	664,000	890,000

They stated, "If new plantings equal only twice the old plantings (i.e., 452,000 acres), the total planted area approximated 1,050,000 acres."

There seems to be an error in addition of some 292,000 acres (452,000 plus 890,000 equals 1,342,000 acres) in this calculation. Furthermore, at another point in the report the investigators accept as a basis for calculating exports that the 4 provinces visited by them export only 70 per cent of the native rubber from the Dutch East Indies. It depends upon how this 70 per cent is used whether their estimated total of the Dutch native gardens approaches within 100,000 or 300,000 the estimated total of 1,600,000 acres made by a later American investigation, but Dutch, British, or American estimates (made in the words of the British official investigators by "very largely a matter of guesswork" in a bearishly inclined market) have in the opinion of the writer been largely over-estimated. An overestimation of native gardens in the N. E. I. of as much as 500,000 acres would reduce potential future production as much as 125,000 tons. Judging by the small relative variance in gross exports from the native garden provinces (see Table I) it will be safe to infer that the planted acreages of native gardens in the N. E. I. has been over rather than under-estimated.

TABLE I

Year	Gross Exports in Tons Netherlands East Indies Exclusive of Java, Madura, and Sumatra East Coast
1923	59,000
1924	80,000
1925	121,000
1926	121,000
1927	142,000
1928	122,000
1929	135,000
1930	115,000
1931 (estimated)	110,000

Land surveys have been completed in British rubber producing areas. As long as large areas in Dutch territory remain unsurveyed, it is futile to attempt to form a rough idea of these native areas, multiply this approximation by a factor of safety (?), add the result to the total of surveyed areas, and expect thereby to determine the total world acreage.

Cultural Methods

Much prominence has been given in the press during the past year or two to the possibility of producing 1,000 pounds of rubber to the acre generally throughout the Far East instead of one-half of this amount as at present. Such a possibility will not enter the realm of probability until from 5 to 10 years after a larger percentage of estates than at present make extensive use of seed selection and bud-grafting. Even among the advanced, modernly equipped estate areas of the Sumatra East Coast, Atjeh, Tapanoeli, a recent special investigation showed that less than one-half of the acreages surveyed is planted with selected material (pure buddings and selected buddings and seedlings). Elsewhere than in Sumatra the planting of selected bud-wood or seedlings is relatively small. It has only been since 1924 that the matter of bud grafting of rubber trees has been given serious attention throughout the Far East, and even today it is frowned at by many as experimental and too expensive.

Preparation Methods

Improvements in the preparation of plantation rubber on the estates have likewise not yet been generally adopted. The bulk of plantation rubber is prepared in the form of ribbed smoked sheets and crepes just as it was during the earlier years of the industry. The utility of liquid latex, however, is becoming gradually better known; consequently this or some other method of preparing plantation rubber for the market may be more generally adopted in future years. If ribbed smoked sheets and crepes continue to be used during future years, it is possible that methods of smoking and drying will be perfected that will lessen to minutes and hours the days and weeks now necessary for these processes.

Possible Future Uses Uncomprehended

The passing of Thomas A. Edison brings to the foreground the pioneer work of his last years in his endeavor to utilize rubber bearing plants that would provide a home source of rubber in time of war. Mr. Edison's patriotism is appropriately signified in his selection of the nation's wild-flower as the nation's source of rubber in time of stress. The progressive steps taken by Mr. Edison's contemporaries in Soviet Russia have also been given wide publicity. (Tau-sagiz with a rubber content of 20 per cent, as well as chondrilla, guayule, and other rubber-bearing plants are being given the attention of the Soviet experts) just as were the research results of the German chemists with synthetic rubber (when rubber was selling for 60 cents a pound and the cost of producing synthetic rubber was over $2.40 a pound).

More publicity should be also given to the research work that is daily going on towards the goal of a wider and more intensive utilization of the commodity itself, which possesses more physical properties than any other of nature's products. It stands to reason that a material that possesses the properties of elasticity (stretching), resiliency (bounding), buoyancy (floating on water), imperviousness to air (containing gases and floating in air), imperviousness to liquids (waterproofing), plasticity (molding), as well as its non-conductivity to electricity and its use in electrolysis and other uses (some as yet undiscovered) provides a fertile field for the Edisons of the future. No other commodity has such wide fields for future growth. Nevertheless it is likely, if and when the skies around our great cities are cluttered with airships, there will still be self-contained prophets who will predict a limit to the possibilities of plantation rubber.

Latex in Paper

Latex shows the best results in paper when used alone. It appears that it does not require to be vulcanized to give very satisfactory results when used with paper, although some latex papers show the presence of sulphur. The presence of rosin is believed to cause rapid deterioration of rubber in paper. If, however, the rosin is thoroughly oxidized as it is with small amounts of sodium resinate in dispersion and also in the presence of antioxidants, the abietic acid in the rosin will not cause trouble.

Michelin Pneumatic Tired Railway Coach

This Novel Type of Railcar Recently Was Demonstrated in a Run from Paris to Deauville at an Average Speed of 60 Miles an Hour

MENTION has already been made in these columns of the British railroad tests with pneumatic tires, which have been quite successful. In France similar tests have been conducted during the last two years. The well-known Michelin firm has taken up the problem of using light pneumatic-tired cars on rails. When the firm first turned its attention actively toward this matter, about the middle of 1929, it discovered that the main difficulty was to make a suitable tire which would stay on the rail with its width of only 4 to 5 cm. to run on. Besides this condition there were other difficulties in the way of smooth and steady running that had to be overcome. Finally a suitable tire was evolved, and after nine different types of vehicles had been tried one has now been adopted that, for the time being at any rate, appears to answer all requirements. The new vehicle, shown below, will transport 24 persons and has a front truck with three axles, and a rear truck with two axles. It has a 20 hp. Panhard motor, brakes on all wheels, reversible transmission, and four speeds. The weight of the empty vehicle is 4,370 kgs. and loaded, 6,530 kgs., that is to say, a useful load of 2,160 kgs. The maximum speed is 100 kms. per hour and the average 90 kms. While a train requires 1,500 ms. before developing a speed of 80 kms. per hour, a light car attains the same speed in 600 ms.; and as to braking, a rail car on pneumatic tires can be brought to a dead stop in 100 ms. when running at 80 kms. per hour, while a train usually requires 1,000 ms.

In recent experiments on the French State Railway System two types of cars were used: one, a larger car with 10 wheels, driven by a Panhard 20 hp. sleeve valve motor, was designed to seat 24 persons; the other, for high speeds, had 6 wheels and was driven by a Hispano 46 hp. motor. In these tests speeds of 90 kms. per hour were attained with the Panhard motor, and of 100.3 to 120 kms. with the Hispano. The running of the cars was better than that of ordinary trains as far as smoothness and silence were concerned, in fact the only sound heard was produced by the engine.

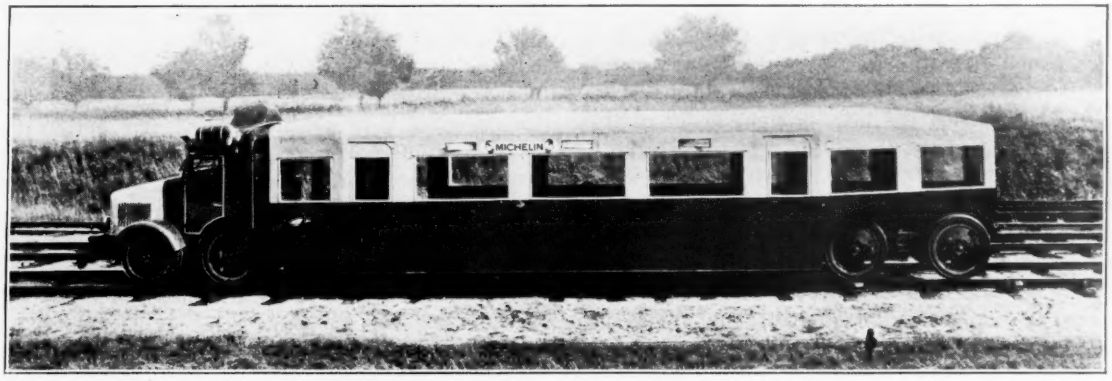
Pneumatic Rail Tire

Among the advantages claimed for the rubber tire is its adhesion to the rail, which is three times that of the steel wheel. The special Michelin tires have an internal device to prevent them from running flat, when punctured, so that they collapse gradually but not completely. The car can be stopped and the tire changed in 3 minutes just as on an ordinary automobile.

It is expected that the use of these cars on secondary lines in France will effect great savings especially on those sectors having usually very little traffic except on market days and holidays. For one thing instead of having partly empty trains running, there will be light vehicles completely full; and, besides, instead of requiring 4 persons to operate the train, a motorman and a conductor are sufficient.

According to recent reports the Chemin de Fer de l'Est (Eastern Railway) of France has placed an order for thirty of these rail cars, which are to be run on a branch line and have seating accommodations for 24 passengers. It further appears that a car to seat 56 persons is now being constructed.

We are indebted to *Revue Générale du Caoutchouc* for the data and the illustrations used in this article.



The Michelin Railway Coach Equipped with Pneumatic Tires

EDITORIALS

Rubber Industry Mourns Edison

WELL might it be said of Thomas Alva Edison as was said on the passing of another great American, "Now he belongs to the ages."

He is among the immortals. Nor is there doubt that the future will regard him as does the present generation as not only a prodigy among inventors but one of humanity's greatest benefactors. His was indeed a name to conjure with, as his spirit was most indomitable. Just as he had literally flooded the world with light, eminently practical scientist that he was, he chose rather to enrich civilization with concrete achievements than merely to add to the maze of theories. With all the honors showered upon him he was ever human and lovable.

The rubber industry was especially intended to be favored by this many sided genius, but alas fate frustrated him in the midst of an unique and one of the most extensive botanical and agricultural experiments ever attempted. In the development of common rubber yielding plants which could be harvested as often and as easily as crops of grain he had patriotically planned not a supply that would actually replace commercial crude rubber but that would be, as it were a nation's anchor to windward, an auxiliary source that might do much to meet a country-wide rubber shortage in the event of the main supply being cut off or limited through war or other emergency.

Dictators for Rubber Regions

IN THEIR distress due to the absurdly low prices prevailing of late for crude rubber, many far eastern planters doubtless wish that for a while they had dictators, or at least executives like those that rule in Texas and Oklahoma. When oil buyers were offering such beggarly prices as 20 and 30 cents a barrel and every other recourse had failed to keep prices above production cost, the governors of the states named called out the militia and ordered the operation of the wells stopped until oil should bring $1 a barrel. Already a price of 70 cents and more has been paid, nearly two-fifths of the nation's oil production has been brought under control, and once more a sellers' as well as a buyers' market is being established.

Whether the bull could be similarly taken by the horns in Malaya, Ceylon, and the Netherlands East Indies, is uncertain, but the checking of tapping or exporting by some such drastic means as has been used in curtailing American oil output might accomplish quite as much as the Stevenson restriction scheme. It, however, may be unnecessary to resort to any such extreme measure to bring again living prices to the rubber growers. Intimations have been made that the Dutch, who have been hit quite hard in the shrinkage of plantations for taxing purposes, are more disposed than ever to abandon their policy of holding aloof and would be quite agreeable to a suggestion from the British that a working plan be set up that would be of mutual benefit. Such a scheme, of course, would be designed primarily to enhance the price of rubber, but it would involve controlling the industry's native mavericks and the yielding of ample revenue.

Chemists Improve on Nature

IN A press comment on the steady improvement during the past few years in various wares a writer remarks casually, "and even rubber goods through some special treatment last longer and give better wear than formerly."

Although he fails to tell why users of rubberware are now getting greater service and satisfaction from their purchases than ever before, and how in this way the public is saving over $100,000,000 annually, it is gratifying to note even that much recognition of one of the greatest advances in the history of the rubber industry since Goodyear's epochal discovery of vulcanization.

It is the story of the development of organic antioxidants in which remarkable progress has been made in the past fifteen years. Old time buyers took much on faith, relied even more on hope, and if the goods did not soon dry out, they regarded the makers with charity. They were warned not to expose many types of rubber goods much to heat, light, or air else makers and dealers would not be responsible for early deterioration. Even undue stretching was to be avoided. Then came the chemists with their marvelous antiaging compounds to work a revolution in rubber compounding and to impart to products a durability hitherto deemed impossible.

Incidentally science had scored another triumph over nature. Crude rubber is said to have a substance which will seemingly protect it indefinitely. A specimen of india rubber in the British Museum is apparently as fresh now as it was when put there a century ago. What that substance is, is not quite clear. It is surmised that it is a form of cholesterol. At any rate it fails to be of practical service. When the rubber is raised to the vulcanizing temperature, heat and sulphur play havoc with the natural protector against oxidation. It remained for research workers to supply an enduring substitute. That they have done a good job is well known to the trade, and even the public is beginning to appreciate the fact that antioxidants have given them in rubber goods greater value for their money than may be had in almost any other sort of merchandise.

What the Rubber Chemists Are Doing

A. C. S. Rubber Division Meetings

New York Group

THE fall dinner meeting of the New York Group of the Rubber Division, A. C. S., was held October 7, at the club rooms of the Building Trades Employers Association, 2 Park Ave., New York, N. Y. 118 members and guests attended.

Group chairman William H. Whitcomb announced that the next meeting will be held on the evening of December 16. The program of papers will be followed by a special entertainment. The following executive committee is in charge of the arrangements: Peter P. Pinto, chairman, Donald F. Cranor, John M. Ball, and Walter L. Sturtevant.

The following nominating committee was also announced by the chairman to report at the December meeting: E. B. Curtis, chairman, W. B. Wiegand, and A. A. Somerville.

The technical paper of the fall meeting was presented by W. J. McCortney of the Chrysler Corp., on "Latest Uses of Rubber in Automobile Construction." The speaker said that automotive engineers have become "rubber conscious" and are utilizing rubber for dampening vibration and eliminating noise at many points in automobile construction. A good example of this utilization of rubber is the Plymouth car, containing 270 rubber parts, 30 of which involve the adherence of rubber to metal. The total poundage of rubber in this car, inclusive of tires, is 141 pounds, 38 of which are contained in the mechanical features of this automobile.

In passenger automobile construction complete absence of vibration and freedom from noise are matters of vital importance. The most effective construction for attaining these results is those specially designed parts in which rubber is vulcanized to metal to eliminate metal to metal contacts.

Among methods available for attaching rubber to metal the speaker discussed the following: (1) the interlocking method; (2) physical adhesion by pressure; (3) thermoplastic cements; (4) hard rubber ply to metal; (5) non-thermoplastic cement; (6) bimetallic attachment or brass plating; (7) special development methods.

The interlocking method consists in surrounding the roughened and perforated metal piece in rubber. Attachment of the rubber to the metal is by interlocking rubber rivets which pass through the perforations in the metal. By this method the strength of the union is practically dependent on the strength of the rubber rivet, and separation of rubber quickly occurs in service by breakage of the rivet.

Physical attachment by pressure was practiced formerly in applying rubber treads to running boards. In this case the metal surface was mechanically roughened, but the union of rubber was weak and unsatisfactory.

Adhesion by thermoplastic cements is employed now for attachment of treads to running boards and rubber to metal trimming parts. This method is useful where the parts attached are subjected in service simply to pressure and to a temperature not exceeding 158° F.

The well-known method of attaching soft rubber to metal by interposition of a thin layer of hard rubber is effective for uniting a solid tire to a wheel rim base but is unsatisfactory in automobile mechanical parts. This condition exists because too much of the resilient rubber is displaced by the non-resilient hard rubber ply, thus reducing the cushioning effect sought.

Non-thermoplastic cements of the hemoglobin type are applicable for rubber to steel attachment. The use of cements that require the evaporation of solvent delays the work. The presence of solvent during vulcanization weakens the attachment and ruins it. Rubber will vulcanize very well when applied directly to certain non-ferrous metals such as brass, copper, and aluminum. Of these brass containing copper 75 per cent and zinc 25 per cent is accounted the best.

Brass plating is, therefore, largely used for the preparation of steel to receive rubber in automobile construction. This bimetallic method of attachment will give adhesion of 150 pounds per square inch. Adhesive cement is used between brass plating and rubber. Humidity diminishes the attachment of rubber to brass and should be eliminated.

After the reading of the paper and during the question period a member asked the speaker to indicate the extent to which carbon black was employed in obtaining these newer and improved results in various automotive rubber members. In reply the speaker stated that it was now general practice to employ ratios of carbon black only slightly less than those characteristic of modern tread compounds. He added that the full benefits of pigment reenforcement were now an integral part of automotive rubber compounding.

Following the above paper, J. W. Bicknell, managing director, United States Rubber Plantations, Inc., showed several reels of moving pictures illustrating that company's rubber producing activities in Sumatra. This exhibition was extremely interesting and featured step by step: clearing the jungle, planting, budding and tapping the trees, collecting and handling latex for making sprayed rubber by the Hopkinson process, and the shipment of latex over-seas by tank steamships. The work and the customs of the native plantation workers and the hospital facilities supplied for their welfare were also depicted.

Los Angeles Group

Dr. Sidney M. Cadwell, director of development, United States Rubber Co., Detroit, Mich., was the guestspeaker at the fifteenth meeting of Los Angeles Group, Rubber Division, A. C. S., in the Richfield Building, Sixth and Flower Sts., Los Angeles, Calif., on October 6. After dinner Dr. Cadwell spoke on "Rubber Antioxidants," emphasizing their necessity, tracing their development, explaining their reactions, and summarizing the theories advanced regarding their effects. Graphs were shown depicting the gain in aging and tensile strength of rubber treated with standard antioxidants as compared with untreated rubber. He also answered many questions relative to the use of antiaging chemicals under special conditions, and exhibited specimens of rubber treated and untreated with age resisters.

President Frank S. Pratt announced that the nominating committee at the next meeting would submit two lists of nominees for the various offices and that an election would be held.

Akron Group

The fall meeting of the Akron Group, Rubber Division, A. C. S., will be held on November 2 at the Akron University Club. Dinner will be served at 6:30 p. m., after which two papers on some entirely new and recent research work from the du Pont laboratories will be read.

While the committee has not disclosed the exact nature of the subject to be discussed, members are assured that a topic of this kind never before has been presented to any of the group meetings, and it is so arranged to be of interest to both the chemist and the more practical rubber worker.

The paper has been divided into two sections. The authors of the first part, the technical presentation, are J. A. Nieuwland, W. S. Calcott, F. B. Downing, and A. S. Carter. Collaborators of the second division, or the practical application of the results obtained, are Wallace H. Carruthers, Ira Williams, Arnold M. Collins, and J. E. Kirby.

Vulcanized Rubber Compounds Immersed in Boiling Water[1]

K. J. Soule[2]

ALTHOUGH to the general public "rubber" is considered unaffected by water, most rubber technologists know that vulcanized rubber is not waterproof and is more or less adversely affected by immersion in water, the extent of the deterioration depending upon the composition of the rubber compound, the temperature of the water, and the period of immersion.

Most of the published data on the water absorption of rubber compounds deal with water at ordinary temperatures, the authors being mainly interested in the possibility of the use of rubber in submarine cables. In this category we may place the work of Boggs and Blake[3], Williams and Kemp[4], and Kemp[5]. Since the experimental work covered by this paper was started Winkelmann and Croakman[6] have reported the influence of various fillers, reclaimed rubber, etc., on the water absorption of rubber compounds. Their determinations were also carried out at room temperature. In none of the literature, however, has there been found any detailed report of the effect on cured rubber of continued immersion in boiling water or water at relatively high temperatures. In view of the many classes of rubber goods, such as valves, hose, packing, hot water bags, etc., which function in contact with hot water, such a study seemed to be of more than academic interest.

The results of this study as summarized by the author are given below.

Summary

Vulcanized rubber finds many industrial applications in contact with or immersed in hot water. A study of its behavior in boiling water has shown that some rubber compounds continue to absorb water and swell after 10,000 hours' immersion in boiling water, without showing any signs of disintegration. Various fillers have different effects on the water absorption. Of the 35 fillers tested, 12 decrease the water absorption, and 23 increase it. Carbon black shows the lowest absorption, and ultramarine blue the highest.

A determination has been made of the loss of cutting resistance brought about by prolonged immersion in boiling water. While there is not perfect agreement between amount of water absorption and percentage cutting resistance loss, in general the stocks having the lowest water absorption show the least loss in cutting resistance, and vice versa.

[1] Presented before the Division of Rubber Chemistry at the 81st meeting of the A. C. S., Indianapolis, Ind., Mar. 30 to Apr. 3, 1931. *Ind. Eng. Chem.*, June, 1931, pp. 654-58.

[2] Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc., Passaic, N. J.

[3] Boggs and Blake, *Ind. Eng. Chem.*, 18, 224 (1926).

[4] Williams and Kemp, *J. Franklin Inst.*, 203, 35 (1927).

[5] Kemp, *Ind. Eng. Chem.*, 22, 1367 (1930).

[6] Winkelmann and Croakman, *Ind. Eng. Chem.*, 22, 1367 (1930).

Flame-Pressure Process for Carbon Black[1]

A. W. Francis[2]

CARBON black suitable for printer's ink and other pigments as well as rubber compounding is usually made by deposition upon a metal plate from a continuous luminous flame of natural gas burning in the open air. The yield by this method has always been low, however, seldom exceeding 3 per cent.

Thermal decomposition of hydrocarbon gases can be made to give 30 or 40 per cent yields of carbon, but because of the high temperature (1,200-1,300°C.) required for a reasonable reaction rate, the product is inferior in tinctorial power and, therefore, unfit for use in printer's ink. In rubber compounding it has only limited use, principally in sidewalls of tires rather than the tread.

Because of the higher quality of carbon black deposited from a continuous flame, numerous attempts have been made to increase the yield. Control of draft and improvement in burner tips have effected only trivial increases. The design of the deposition plates has distinguished various processes, such as the channel, disk, plate, and cylinder processes, but these distinctions are only superficial.

Since carbon is an incomplete combustion product of hydrocarbons, it is a common fallacy to suppose that its production could be increased by stifling the flame in some way. This has been the subject of several patents. At least one of them recommends a mixture which is completely non-inflammable. The idea can be disproved easily by experiment, since any attempt to stifle a hydrocarbon flame by mixing carbon dioxide or nitrogen with the gas or the air supply, or by limiting the supply of air, makes the flame nonluminous. The effect of even traces of carbon dioxide in decreasing the luminosity of flame is well known. The candlepower of a flame is decreased 3.4 per cent by 0.1 per cent carbon dioxide in the atmosphere.

Parts of Hydrocarbon Flame

For the present purposes luminous hydrocarbon flames may be considered as divided into four parts: the inner dark portion consisting of gas-air mixtures too rich to burn (really not part of the flame at all); the intermediate pale blue zone of preliminary combustion and rising temperature; the bright yellow portion where the temperature is high enough to decompose some of the unburned hydrocarbon to free carbon, which is usually burned in the same zone unless a cooler solid is interposed; and the outer blue envelope (top, sides, and bottom) containing little or no hydrocarbon, but considerable hydrogen and carbon monoxide from incomplete combustion in the luminous zone. These are usually burned completely before leaving the flame. The pale blue zone in a methane flame is wide because the temperature of thermal decomposition is high and more time is required to reach it; but with higher hydrocarbons, which are more easily decomposed, this zone may become vanishingly thin. Its inner border in all cases is defined by the locus of mixtures corresponding to the upper inflammability limit of the gas (with trivial corrections for preheating and rate of flow of gas). The great theoretical and practical significance of the upper inflammability limit upon yield of carbon has been neglected heretofore.

The author reports the results of his study of the flame-pressure process of producing carbon black and regarding the quality of the carbon produced remarks as follows:

Quality of Carbon Produced

The carbon produced in these experiments is equal in tinctorial power to, and apparently identical with, the best grades of carbon black now on the market. The quality and the tinctorial power of the products were tested by making pastes with linseed oil and rubbing on a microscope slide in comparison with some premium commercial carbon blacks; and also similar pastes with zinc oxide containing 1 per cent of the blacks. The slides gave true blacks and grays, respectively, which matched those of the standard blacks in color and shade.

The quality of black seemed to be the same whether it was made from methane, propane, gasoline, or even paraffin, in the flame-pressure process.

General Summary

The best grades of carbon black are made by burning hydrocarbon gases with a continuous flame. The yields are seldom over 3 per cent because the upper inflammability limits of the hydrocarbons are so low that an excess of oxygen is always present to consume most of the carbon. Stifling the flames is futile.

Since an increase in pressure raises the upper inflammability limits, much higher yields of carbon black can be obtained by burning hydrocarbons continuously in an atmosphere of compressed air. Yields of high grade carbon black have been trebled at 100 pounds' pressure in small scale equipment, and computations have been made indicating that this can be increased much more. The process also permits utilizing the heat of combustion of the gas.

[1] Presented before the Division of Petroleum Chemistry at the 81st meeting of the Amer. Chem. Soc., Indianapolis, Ind., Mar. 30 to Apr. 3, 1931. *Ind. Eng. Chem.*, June, 1931, pp. 612-17.

[2] Arthur D. Little, Inc., Cambridge, Mass.

Cracks in Stretched Rubber[1]

STRETCHING and the action of ozone are essential for forming cracks in rubber. By night experiments it was definitely proved that light is not necessary for crack formation, that in fact it frequently has a negative effect because of the formation of a surface film. The development of the cracks generally starts with about 8 per cent stretching. The formation of the largest cracks closely covering the entire surface reaches maximum with about 10 to 20 per cent stretching; beyond this degree of stretching the cracks gradually become smaller.

Artificially ozonized air produces the same cracks as the outside air, only far more rapidly. Nitric-oxide, sulphur-dioxide, and chlorine form no cracks. In unstretched rubber, no cracks form, even with the highest concentration of ozone. Neither the sunlight nor light from mercury quartz lamps is essential for forming cracks.

The effect of the degree of vulcanization on the formation of cracks is referable to mechanical properties and the stiffness of the vulcanized rubber. The less the stiffness, the larger the cracks become.

The type of crude rubber or the fillers has no basic effect on crack formation, nor do additions of accelerators, antioxidants, or organic substances cause fundamental changes in the type and the manner of checking.

It is, therefore, expressly emphasized that cracking under the influence of ozone is to be regarded as typically characteristic of stretched rubber. Only the presence in the mixing of softeners which bloom is able to prevent the formation of cracks when the concentration of ozone is very slight. Cracks formed in goods exposed to atmospheric influences can be referred to stretching in places where cracks appear.

[1] A. van Rossem and H. W. Talen, *Kautschuk*, May, 1931, pp. 79-86; June, 1931, pp. 115-17.

Degradation of Rubber in Solution as a Function of Time and Temperature[1]

THE investigators have derived equations for the degradation of rubber as function of time and have applied these in tests where different solvents have been used. Definite conclusions from results obtained so far are withheld until complete data are available. In the meantime, however, it seems that the results agree with the theory based on molecules in long solvable chains, the influence of the temperature in the presence of certain solvents possibly causing rupture outside of the normal bonds of polymerization.

In any case, it seems that there are two types of degradation of rubber, the first brought about without decomposition of the original molecule, and the second, in which this decomposition is accompanied by the production of products of pyrogenation; this decomposition appears to depend not only on the temperature but also on the nature of the solvent employed.

[1] P. Bary and E. Fleurent, *Rev. gén. caoutchouc*, Aug., 1931, pp. 12-14.

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Boston Rubber Group

The next meeting of the Boston Group Rubber Division, A. C. S., is set for Thursday evening, December 3, 1931. An announcement covering details of the meeting will be mailed shortly to the group members and others interested.

R. & H. Accelerators

The following rubber vulcanization accelerators formerly sold by The Roessler & Hasslacher Chemical Co. will henceforth be sold by E. I. du Pont de Nemours & Co., Wilmington, Del.; ethylidene-aniline, R. & H. 50; R. & H. 40; R. & H. 397; T. M. T. T.; and ambrex.

The Roessler & Hasslacher Chemical Co. through its established offices will continue the sale of the following vulcanization accelerators: diphenyl guanidine (DPG), hexamethylene tetramine (Hexa), and aldehyde ammonia.

Technical Communications

The publishers of INDIA RUBBER WORLD are not responsible for statements and opinions appearing in this department

Carbon Black Compounding

CARBON black, while it is the most effective reenforcing agent available for addition to rubber, is one of the more difficult to incorporate. Since its reenforcing action is due to its fine particle size and probably also to its specific adhesion once it is wet by the rubber, it is important in all cases to secure as complete a dispersion of the black in the rubber as can be attained. This constitutes the first condition for optimum results. No practical method of dispersing carbon black in rubber equals the heavy shearing or grinding action of a rubber mill or an internal mixer on a master batch of high viscosity.

The recommended composition of a carbon black master batch lies in the following range:

Rubber	100
Micronex	60 to 75
Pine tar (medium)	3 to 4

For high-grade tire-tread work the above ratio of pine tar represents about the optimum dosage, allowing for the addition of up to 4 per cent of stearic acid on the rubber in the final tread compound, since it has been shown that the use of emolients in tire treads results in lowered abrasion resistance and that they must be used only in such amount as is necessary for other purposes. In some instances it is desirable to add some stearic acid to the master batch; the ratio depends on the final compounds in which the master batch is to be used. Data from Binney & Smith Co., 41 E. 42nd St., New York, N. Y.

Trichlorethylene—A New Solvent

TRICHLORETHYLENE, commercially known as Tri, is a chlorinated hydrocarbon, with the formula C_2HCl_3. It is water white in appearance, with a sweet odor, and a boiling point of 86.7° C. (188° F.). The commercial product has a distillation range of less than one degree C. (1.8° F.) and a density of 1.4762 at 15°/4° C., or 12.25 pounds per gallon. Its physiological action is mild, being lower than that of gasoline, chloroform, and many other solvents according to available data. It is non-cumulative in its effect on the human system; that is, it is quickly eliminated from the body and causes no impairment to health on prolonged exposure to moderate concentrations.

This non-inflammable liquid can be used alone as a general rubber solvent or mixed with flammable solvents to lower their fire hazard or increase their solvent range. Since it is non-corrosive to ordinary construction metals it is used in equipment constructed of common materials. Tri is well adapted for rubber investigational work by virtue of its high solvent power for rubber, its non-inflammability, and its ease of recovery. Apparatus ordinarily used for such work is suitable for this material. As a solvent for rubber cements it finds extensive application. It readily holds rubber in solution and on exposure to air evaporates rapidly and completely. No lingering odors are left. Tri is harmless to materials or fabrics with which it comes in contact. Data from The Roessler & Hasslacher Chemical Co., Niagara Falls, N. Y.

Plastex

PLASTEX is a new acid resisting jointless and seamless rubber lining material of British manufacture. It is applied in paste form, which after air setting becomes a resilient lining with as high a chemical resistance as ebonite. The material is exceptionally adhesive and can be efficiently applied to surfaces of any material, new or old. It gives off no inflammable or injurious fumes so that the covering of enclosed equipment is perfectly safe for the operator. Data from Sir S. W. Royse & Co., Ltd., 20 Albert Square, Manchester, England.

Carbon Tetrachloride

THE following paragraphs quoted from a recent address[1] are of interest to rubber workers and others who use carbon tetrachloride, pure or in mixtures.

As a solvent carbon tetrachloride shows a greediness for fats wherever it finds them. This may be in the skin of a workman if his work requires him to have his hands in contact with this material for any length of time. The final results depend partly on the length of time of the exposure and partly on the individual's personal susceptibility.

When the skin is acted on by carbon tetrachloride, it becomes red and dry. If contact is long continued, cracks may appear, which are not only annoying but from which infections may readily arise. As is common in the use of gasoline, the skin of some persons is much more prone to this kind of disturbance than is that of others.

Accurate observations on the effect of breathing small amounts over a long period of time are not available. Until we know more about these effects, it is most important that all known precautions be observed in its handling. Among these precautions are:

1. It should be used in completely enclosed systems as far as practicable. This is a simple problem in some processes, as in the extraction of fats for their eventual recovery, but more difficult of attainment in others.

2. When completely enclosed processes are not feasible, an exhaust system should be installed with at least one outlet near the floor (as the vapors are heavier than air). This system should be kept in operation constantly as long as the liquid is exposed to the air and for some time after such exposure has ceased so that the room or compartment may be rid of all residual vapors.

3. A careful watch should be kept on all persons who are, in the slightest degree, exposed to the breathing of these vapors. They should preferably be under the care of a physician who is accurately informed on the nature of the material in question. On the slightest indication of ill health arising from the use of this compound, the worker should be transferred to a jo[1] in which he is in no way exposed to it.

The two most definite needs at the present time are trustworthy information on the effect upon man of the inhalation of small amounts of this material over long periods of time, and a quick and accurate method for the determination of various concentrations of carbon tetrachloride in the air.

The United States Bureau of Standards and the United States Public Health Service are now giving the use of this material in the dry cleaning industry definite consideration. If the results of their studies enlighten us on these two points, we shall know exactly what procedure to follow in its use. Until that time it is far better to be apparently over-cautious than to be lax and later regret our indifference.

[1]Address delivered by Elizabeth B. Bricker, M. D., Chief, Hygiene and Sanitation Section, at meeting of Pennsylvania Association of Dyers and Cleaners, Harrisburg, July 15, 1931. Abstracted from *Labor and Industry*, Aug., 1931.

Plaskon

PLASKON is a new urea-base compound evolved at Mellon Institute, Pittsburgh, Pa., under a series of industrial fellowships.

Plaskon molding compound is said to be easily performed, and this property, in conjunction with the high speed of cure, makes possible rapid low-cost mass fabrication by the molder. Fabricated Plaskon has excellent color possibilities, combining bright colors with a hard, lustrous surface. Its base shade is one of neutral translucency, permitting pigmenting to give all colors of any intensity, either opaque or translucent. Obviously infinite variations in mottled or striated effects are possible. The mechanical and electrical properties of Plaskon are said to be excellent. Data from the Toledo Synthetic Products Co., Toledo, O.

New Machines and Appliances

Gordon Plasticator

THE 15-inch straight line, two stage Gordon plasticator here pictured has been designed for the smaller factories without the capacity to absorb the output of the 20-inch machine, as well as for the larger plants who do not wish to concentrate too large a volume of production in a single unit.

The operation of the plasticator is automatic, except for feeding and handling the stock. For the 15-inch plasticator crude rubber is delivered in twelfth-bale pieces (about 17 pounds) by truck or conveyer and, after passing through the machine, is discharged in a continuous tube about 5 inches in diameter, which is slit and cut into lengths.

Without auxiliary conveying equipment one man feeds the machine, and one man handles the discharged stock. Both have sufficient time to assist with trucking cleaning up, or other duties. One man can attend the feed hoppers of two machines. The installation of conveying equipment or a soapstoning, cutting-off and conveying device eliminates the man at the delivery end and enables one man to handle the plasticator alone.

The 15-inch straight line, two stage plasticator has its two stages in line and within a single cylinder. The rotor is carried on two heavily built roller bearings, and the thrust bearing, also of the anti-friction type, is self alining. All bearings are housed to protect them from dust and dirt and carry sufficient lubrication so that renewal is necessary only at infrequent intervals.

A 300 hp. motor is required for maximum production, but the actual power consumption is about 280 hp. The speed of the motor may be between 500 and 720 r.p.m. If the plasticator rotor runs at 30 r.p.m., the production is about 12½ pounds of rubber per hp. hour.

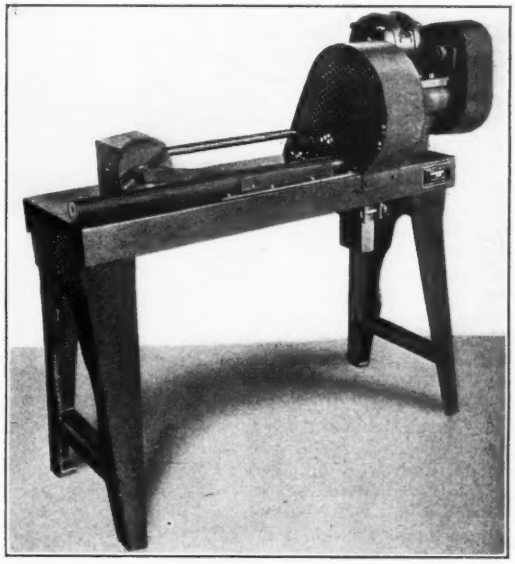
About 2,300 pounds per hour can be expected, or about 14 pounds of rubber per hp. hour, with a 200 hp. motor and the rotor at 20 r.p.m. The actual horsepower consumed at this speed is about 176. Production per hour is greater and the horsepower consumed less for succeeding passes. On second pass with the rotor at 30 r.p.m., the production is about 16 pounds per hp. hour. For successive passes the production per hp. hour continues to increase somewhat. Farrel-Birmingham Co. Ansonia, Conn.

Tube Stock Cutter

A NEW machine designed for cutting tubed stock into pieces varying from thin slices to those 6 inches in length is pictured in the accompanying illustration. The device comprises a motor driven disk knife with motor and connecting power transmission mounted on one end of a lathe bed.

A shaft extending from the source of power transmits motion to a gearing that operates a slotted disk crank. The latter serves as a means for adjusting the motion of a lever that advances the carriage upon which rests the stock to be cut.

The machine has a constant speed motor with variable speed attachment and cuts from 100 to 300 pieces per minute according to the length of cut. It is adapted for cutting uncured stock for mold blanks or sectioning cured stock to finished lengths. Utility Mfg. Co., Cudahy, Wis.



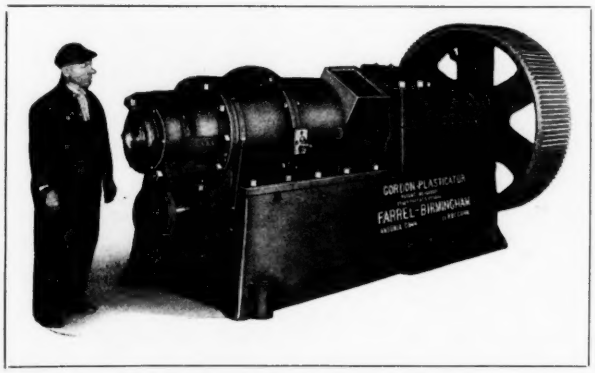
Utility Tubed Stock Cutter

Belting Vulcanizer

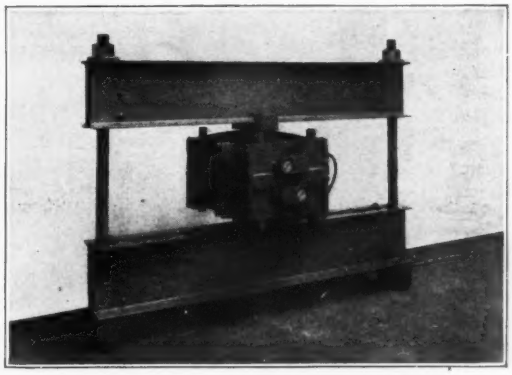
ALL rubber belting is liable to snags or cuts occurring in service. This is more particularly true of conveyer than of power belting. Such breaks through the protecting rubber cover of a belt can be repaired conveniently and advantageously by means of the portable vulcanizer here pictured. Three standard sizes of these vulcanizers are made, and others are to follow.

When used for splicing, these machines are furnished with clamp bolts instead of the steel frame work shown in the illustration. The belt is clamped between the two platens by clamp bolts, and pressure of approximately 100 pounds per square inch is secured. Each half of the vulcanizer is equipped with an aluminum platen, which comes in contact with the surface of the belt. These platens are heated by electric elements spaced over the back of the platens. In this way the heat is distributed with a fair degree of uniformity. Each platen is equipped with an automatic control which serves to maintain the temperature at a uniform degree.

When the machines are furnished for making repairs to cuts or snags in conveyer belts, they are furnished with steel frame work as shown in the picture. This is necessary so the clamping arrangement will span the entire width of the belt. The particular outfit shown may be used on belts up to 5 feet in width. There are no



Gordon 15-Inch Plasticator



Heintz Portable Belt Vulcanizer

rollers under these vulcanizers. When the machines are used, the various parts are assembled right at the work. James C. Heintz & Co., Cleveland, O.

Gage Protector

THE gage protector illustrated is a simple, three-part, bronze bodied, rubber bulbed pressure transmitting instrument, used to transmit line pressures to gage recordings by means of a secondary, or bulb pressure; these recordings are the result of the compression of the secondary bulb liquid by a given line liquid.

The gage protector is strictly non-technical. Its three parts consist of the main body of the instrument, the pressure transmitting bulb, and the bulb retainer. The body of the protector is made of a special bronze that is highly resistant to acids and other injurious fluids. It is accurately machined throughout and made to withstand severe service abuse.

The most vital and only working part is the glycerine (or castor oil) filled pressure transmitting bulb, which is at all times in direct contact with the exterior line pressures and the interior bulb fluid pressures. Because of this fact the rubber used in the manufacture of the bulb is specially treated for providing resistance to acids and other fluids.

The protector is a pressure transmitting instrument operating by compression of the secondary bulb liquid (glycerine or castor oil) by the line liquid. That is, the rubber pressure bulb is so installed that the line pressure (either fluids, liquids, or air) is at all times operating against its base. This pressure action in turn compresses the glycerine (or castor oil) filled bulb and causes it to exert the necessary recording pressure against the gage movement, this in turn causing the poundage registration.

This gage protector can be installed at any place desired in the line. When used as an individual unit, it is installed below the gage. No extra fittings are needed aside from the standard adaptors for the particular lines where the protector is installed. Champion & Barber, Inc., 576 Subway Terminal Building, Los Angeles, Calif.

Champion Gage Protector

Hose Nipple of Special Design

AN IRON pipe thread hose nipple of special design is pictured in the accompanying illustration. It is made in sizes from 1 to 4 inches inclusive and is intended for use in regular pole-made or braided fabric hose, eliminating the costly enlargement of the ends of the hose as is the case when regular iron pipe nipples are used. That portion of the nipple out of

King Hose Nipple

hose is exactly like an iron pipe nipple, being equipped with iron pipe threads. The shanks are corrugated to give greater gripping strength and are for hose of the same inside diameter as the pipe thread. That is to say, nipples of the 2-inch size have 2-inch shank for 2-inch inside diameter hose (ends not enlarged) and are equipped with 2-inch iron pipe thread.

These nipples are furnished of malleable iron, either plain or rust-proofed by cadmium plating and permit the reattaching to hose in case of injury; whereas this reattachment is not possible with regular iron pipe nipples. Dixon Valve & Coupling Co., Hancock St. and Columbia Ave., Philadelphia, Pa.

Microscope to Fit in Vest Pocket

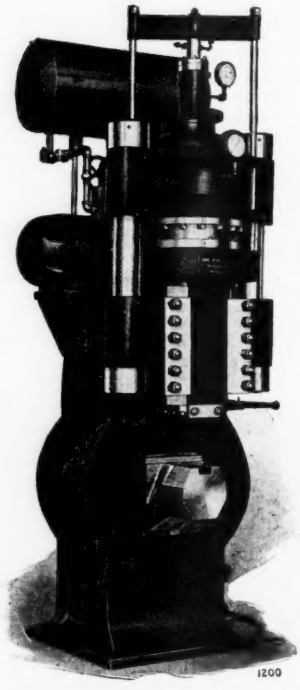
A POCKET microscope shaped like an oversized fountain pen convenient for carrying in the vest-pocket, has recently been invented. It is focused by a slight movement of two fingers. Magnifications of 40, 50, or 60 diameters are secured simply by pulling out the barrel tube. The lenses are ruggedly mounted and easily removed for cleaning. Rubber chemists, compounders, and departmental inspectors will find this pocket instrument a desirable aid in their work. G. W. Ripley, P. O. Box 570, Cleveland, O.

Hydromatic Press

THE horning press here pictured is a high speed self-contained hydraulic unit introduced under the trade name "Hydromatic." These presses are made also in the usual column types and with the columns enclosed in large housings for gib guiding the moving platen, the same as on large crank presses. Hydraulic die cushions for drawing may also be built into the presses. These presses are made in sizes and capacities in order to suit any demand.

The hydraulic press will stroke the required distance and build up on the work in the press a known pressure. The crank or toggle press will operate on a fixed stroke. The developed pressure depends on the resistance offered and is unknown and uncontrollable. Incorrect die set-up or extra thickness of stock, therefore, causes overpressure and consequent breakage of the press or dies. An hydraulic press of the modern type assures greater safety in this respect.

Hydromatic units operate by pedal or hand lever, and the latter also acts as an emergency release at any part of the cycle by motion of the lever upward. The unit can be set to operate at any desired stroke or pressure, and when this pressure is reached, the press may be set instantaneously to reverse to open position; or it can be set to hold the desired pressure for any period of time and then automatically return to the open position. The opening of the press is easily adjustable by setting a collar on a control rod. The French Oil Mill Machinery Co., Piqua, O.



300-Ton Horning Press

American Rubber Executives

Charles Edward Bishop, mgr. *b.* Oct. 18, 1881, Loudonville, O.; Loudonville High Sch., Ohio State Univ., Columbus, O., mech. engr.; joined The B. F. Goodrich Co., Akron, O., making golf balls and molded goods, 5½ yrs.; golf balls and hose, Republic Rubber Co., Youngstown, O., 1½ yrs.; foreman of mill and refining dept., Alkali Rubber Co., now Philadelphia Rubber Works, Akron, O., 1½ yrs.; supt. solid tire div., Goodyear Tire & Rubber Co., Akron, O., 6 yrs.; supt. Goodyear reclaiming plant, 7½ yrs.; asso'd. with Frank S. Seiberling and Wm. Welch in incorp. Akron Rubber Reclaiming Co., Barberton, O., and was v. pres., member of board, and factory mgr., 2 yrs.; planned reclaiming plants of Miller Rubber Co., Kenmore, O., and Endicott-Johnson Shoe Co., Johnson City, N. Y.; factory mgr., Premier Rubber Mfg. Co., Dayton, O.; author of papers on rubber reclaiming; specializes in rubber mfg. and reclaiming engrg. *Address:* 381 S. Canton Rd., Akron.

Thornton Gillmor Graham, v. pres. *b.* Jan. 30, 1889, Lee, Mass.; Mt. Hermon Sch., 1909; C. E., Princeton Univ., 1914; Goodyear Tire & Rubber Co., Aug., 1914-Feb., 1917; Falls Rubber Co., Mar., 1917-May, 1918; Inland Rubber Co., June, 1918-Apr., 1921; Mason Tire & Rubber Co., May, 1921-Nov., 1925; B. F. Goodrich Co., since Dec., 1925, v. pres. *Member:* Mason, Soc. Auto. Engrs., Portage, Portage Riding, and Twin Lakes Country clubs. *Address:* business, B. F. Goodrich Co., Akron, O.; residence, 412 W. Main St., Kent, O.

Robert J. Houston, sec.-treas. *b.* Apr. 2, 1891, Wadsworth, O., Wadsworth primary and high schs.; taught school 3 years; accountant, Goodyear Tire & Rubber Co., Akron, O., 1912; special accountant with Akron Cultivator Co., B. F. Goodrich Co., Akron, Babcox & Wilcox Boiler Co., Barberton, O., later joining accounting firm of Chandler, Murray & Chilton; assist. to sec.-treas., Akron Rubber Reclaiming Co., Akron, June, 1926, and sec.-treas., Mar., 1928. *Member:* Masonic order, Barberton Kiwanis Club, Republican. *Address:* business, Akron Rubber Reclaiming Co., Akron, O.; residence, 244 1 Pardee St., Wadsworth.

L. A. McQueen, sales mgr. *b.* Jan. 5, 1893, Superior, Wis.; Superior High Sch., A. B., Univ. of Wisconsin, 1916; same year joined The B. F. Goodrich Co., Akron, O., becoming asst. advg. mgr., advg. mgr., and gen. mgr. of tire sales, resigning Oct., 1929; apptd. sales mgr. General Tire & Rubber Co., 1929. *Member:* Mason, University and Portage Country clubs, Akron, O., and Lotos Club, New York, N. Y. *Address:* business, General Tire & Rubber Co., Akron, O.; residence, 320 Devonshire Rd., Akron, O.

The brief personal sketches to be published on this page will eventually form a valuable record of the part played by American rubber executives in the progress of the industry. Presidents, vice presidents, secretaries, treasurers, sales and advertising managers, and other "key-men" are invited to send us their biographical data.

Curtis Lyman Moody, factory mgr. *b.* Feb. 2, 1893, Glen Rock, Pa.; F. & M. Acad., 1908, Gettysburg Coll., 1912; gen, supt., Fisk Rubber Co., Chicopee Falls, Mass., 1916-30; factory mgr., Dominion tire plant, Jan.-Nov., 1930; same position since with U. S. Tire Co., Detroit, Mich. *Member:* Soc. Auto. Engrs., Mason, Chicopee, Mass., Lodge. *Address:* residence, 704 Washington Rd., Grossepointe, Mich.

W. Edwin Palmer, sec., asst. treas. *b.* Aug. 31, 1874, Hudson, O.; Hudson High Sch., Western Reserve Acad., Hudson, O., and Eastman's Coll., Poughkeepsie, N. Y., 1893; joined Goodyear Tire & Rubber Co., Akron, O., Jan., 1899, serving 22 years as bookkeeper, cashier, asst. sec., asst. treas., sec. and treas.; joined Seiberling Rubber Co., 1921, and since sec. and asst. treas. *Member:* Mason, 33d degree, Scottish Rite, and member of affiliated organizations. *Address:* business, Seiberling Rubber Co., Akron, O.

Clifton Slusser, v. pres., factory mgr. *b.*: 1890, Massillon, O.; grammar sch., business coll.; stenographer for production supt., Goodyear Tire & Rubber Co., Akron, O.; practical experience in all depts.; organized Flying Squadron with general experience to balance production and later Engrg. Squadron for emergencies; took charge of Goodyear Canadian plant; took over efficiency, planning, garage and trucking, and labor depts., factory expert work, and aeronautical work; personnel mgr. and member of executive council of five, 1919; gen. supt. new Goodyear plant, Los Angeles, Calif., 1920; transferred to Goodyear (Akron) as factory staff director, later appointed factory mgr. and v. pres. *Address:* Goodyear Tire & Rubber Co., Akron.

Holland B. Slusser, v. pres., treas. *b.* Apr. 10, 1887, Louisville, O.; grammar schs., New York, N. Y., high sch., Canton O.; Univ. Michigan, B. S., chem. engrg., 1910; chem., Diamond Rubber Co., Akron, O., 1910-13; chem., B. F. Goodrich Co., Akron, 1913-16; plant. supt., Knight Tire & Rubber Co., Canton, O., 1916-17; div. supt., Hodgman Rubber Co., Tuckahoe, N. Y., 1917; v. pres. Pocono Rubber Cloth Co., Trenton, N. J., 1920, treas., 1923. *Member:* Phi Kappa Sigma; Amer. Chem. Soc.; Carteret and Kiwanis clubs, Trenton, N. J.; Springdale Golf Club, Princeton, N. J. *Address:* business Pocono Rubber Cloth Co., Trenton, N. J.; residence 10 Ober Rd., Princeton.

Rolla S. Thompson, development eng. *b.* 1889, Warren, O.; grammar and high sch., Warren. Lab. staff, Republic Rubber Co., 1911; Hard Rubber Div., B. F. Goodrich Co., 1915; supt. hard rubber, Brunswick-Balke-Collender Co., 1917; mgr. Hard Rubber Div., Hood Rubber Co., 1919; mgr. Belting and Molded Goods Dept., Rep. Rubber Co., 1922; tech. factory engr. Sheller Wood Rim Mfg. Co., 1925; tech. supt., Inland Mfg. Co., 1929; mgr. New Products Div., Packard Electric Co., 1931; *Member:* Mason, Knight Templar, Shrine, B. P. O. E., *Address:* business, Packard Electric Co., Warren; residence, Parkman Rd., N. W., Warren.

George A. Waddle, asst. sales mgr. *b.* Brilliant, O.; A.B., Bethany Coll., 1901; LL.B., Western Reserve U., 1905; practiced law, Cleveland, O., 1905-15; joined dealers' div. auto. tire dept., Goodyear T. & R. Co., Akron, O., 1915; made mgr. dealers' sales dept., mgr. dealers' relations dept., and asst. sales mgr.; rep. Goodyear Co. 5 years on exec. com., Tire Mfrs. Div. (chrman. of div., 1925-26), R. M. A. *Member:* Sigma Nu, University Clubs, Washington, D. C., Portage Country Club, Akron, and Lotus Club, New York, N. Y.

Raymond L. Wetzel, advg. mgr., asst. sales mgr. *b.* Feb. 13, 1895; grade and high schs., 1911; special high sch. courses 1920-22; Ohio Bell Tel. Co., 1911-13; Delco Light, 1913-15; Beaver Soap Co., sales, 1916-17; U. S. A. Air Service, 1917-19; Beaver Soap Co., sales and advg., 1919-20; Recording & Computing Machine Co., exec. sec., 1920-24; *Dayton News* and *Dayton Herald,* edit. and advg., 1924-25; Dayton Rubber Mfg. Co., 1925-31, sales promotion mgr., asst, sales mgr., advg. mgr. *Address:* business, Dayton Rubber Mfg. Co., Dayton, O.; residence, 521 Monteray Ave., Dayton.

Frank Leonard Young, dist. sales mgr. *b.* May 29, 1894, Abilene, Kan.; Oklahoma City High Sch.; salesman for Goodyear Tire & Rubber Co., 1920-21; salesman for Shook Rubber Co., 1922-28, and sales mgr., 1928-30; apptd. Southwestern Dist. sales mgr., General Tire & Rubber Co., 1930. *Member:* Mason, Knight Templar, Dallas Athletic Club. *Address:* business, 2117 Commerce St., Dallas, Tex.

Rubber Industry in America

OHIO

Goodyear Notes

Goodyear Tire & Rubber Co., Akron, recently appointed M. K. Moore, manager of the accessories and repair materials department, as manager of tube sales. O. G. Stinchcomb, former manager of the Pacific Coast division accessories and repair materials department, has been transferred to Akron to succeed Mr. Moore, being succeeded by L. S. Frary, staff man in the Akron accessories and repair materials department. Mr. Moore has been with Goodyear since 1918, serving as assistant manager of merchandise distribution department and staff man in the automobile tire department. Mr. Stinchcomb joined the company in 1920 as instructor in Goodyear Industrial University, as accessories and repair materials salesman, tire salesman, manager of the Goodyear Tire Repair School, and manager Pacific Coast accessories sales. Mr. Frary has been a tire salesman at the Minneapolis branch of the company and for the past two years has been on the staff of the Akron accessories division.

Vice President and Factory Manager Clifton Slusser last month completed 20 years' service with the company and was awarded a service pin by President P. W. Litchfield. Mr. Slusser started with Goodyear as a stenographer in the credit department and from that time on his rise to prominence as an executive in the rubber industry was marked, rapid, and distinctive in many outstanding accomplishments.

R. P. Dinsmore, chief chemist, has been named honorary secretary of the Massachusetts Institute of Technology to represent the institute in the Akron district. He will consult with prospective students and assist them in determining their qualifications for a scientific or engineering education. Mr. Dinsmore was graduated from the institute in 1914. He is a member of the American Chemical Society, American Association for the Advancement of Science, and American Institute of Chemical Engineers. He is also a fellow of the Institution of the Rubber Industry of London.

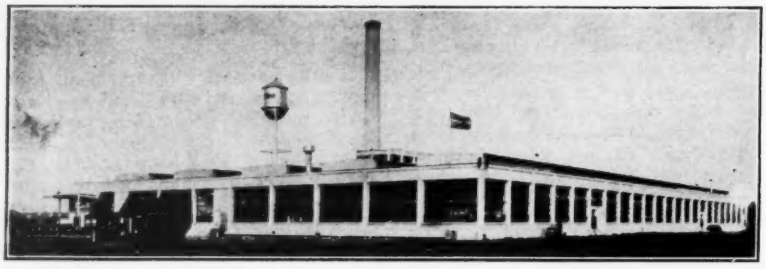
Secretary Adams of the Navy last month notified Rear Admiral Day at Akron to accept the airship *Akron*. The ship recently left the hangar for her base at Lakehurst, N. J. Secretary Adams also authorized construction of the airship *ZRS*-5, sister ship of the *Akron*, which is to cost approximately $2,450,000 and will furnish employment for 800 men.

Firestone Tire & Rubber Co., Akron, announced that effective October 1 all salaried office employes would receive a 10 per cent wage cut and a reduction from the five and a half-day to a five-day week schedule. The reduction does not apply to plant personnel now operating 6 hours a day, 4 days a week.

Premier Rubber Mfg. Co., Dayton, is erecting a new $15,000 brick addition to its plant at Edmund Street and B. & O. R. R., which will be ready for occupancy early in November. The new building will contain approximately 7,500 square feet of space to be utilized for offices and laboratory. Space occupied by these departments in the present building is needed for factory expansion. Officers of the company are: Joseph Westendorf, president; Harry Gerstner, vice president; John Westendorf, treasurer and general manager; Louis Jacobs, purchasing agent; and B. Sharp, superintendent. J. L. Fitzgerald is in charge of the company's laboratory.

The Diamond Rubber Co., Inc., Akron, because of the very narrow heels now being worn by women everywhere, has changed the style of its perforated rubber mats, making all the various designs with perforations so small that there is no danger of the smallest heel catching in them. This change at the same time increases the wearing surface of the mats, and reduces the possibility of damage through careless handling when the mats are shifted about.

Novelty Supply, S. Akron, makes finger cots, nipples, pouches, special dipped goods, etc. B. E. Whitehead is president, and H. Sutterly secretary-treasurer.



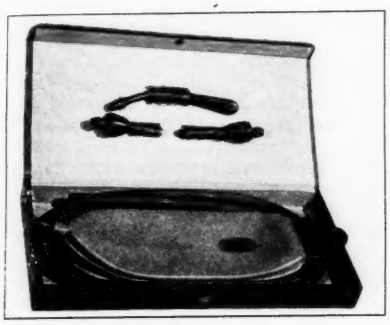
Plant of The Goodyear Tire & Rubber Co., Buenos Aires, Argentina

Alfred C. Fickes

Alfred C. Fickes, for the past eight years general sales manager of the Lancaster Iron Works, Lancaster, Pa., and well known in steel plate fabricating lines, recently became associated with The Biggs Boiler Works Co., Akron, as sales manager. He has been identified with the steel industry for many years, as a mechanical and structural engineer with the Philadelphia & Reading Coal & Iron Co., Lehigh Coal and Navigation Co., Southern Pipe Line Co., Bethlehem Steel Co., and McClintic-Marshall Construction Co., before entering the service of the Lancaster Iron Works in 1915 as chief engineer.

Richard L. Cawood, president of The Patterson Foundry & Machine Co., E. Liverpool, has been elected president of the Potters Bank & Trust Co., E. Liverpool, a consolidation of the Potters National Bank and the Dollar Savings Bank. Mr. Cawood is also president of The Patterson Steel Products Co., The Patterson Refractories Co., The American Paper Products Co., and The Richard L. Cawood Co.

M. E. (Earle) Mansfield has joined the J. M. Potter Oil Co., Inc., wholesale and retail distributer of Pennzoil products in Summit, Medina, and Portage counties. Mr. Mansfield, who is well known in Akron rubber circles, having been with the Firestone Tire & Rubber Co. at Toledo, and a sales representative for General Tire & Rubber Co., and the retail division of Ceylon Tire Co., Akron, will take charge of the retail division of the company handling the distribution of Mohawk tires and tubes. The Mohawk products are a recent addition to the company's line.



Miller Anode "Pullman" Fountain Syringe

Goodrich Activities

The B. F. Goodrich Rubber Co., Akron, last month held its fall sales conferences at Akron, Atlanta, New York City, Chicago, and Los Angeles. The first of the series of conferences was held at Atlanta, where a group of sales and advertising officials headed by Vice President S. B. Robertson and C. B. O'Connor, general tire sales manager, attended. The following officers also were present: W. C. Behoteguy, merchandise manager; W. C. Bray, manager of bus and truck tire sales; E. R. Bell, accessory sales manager; J. P. Woodlock, manager of Goodrich Silvertown, Inc., retail division of Goodrich; and P. J. Kelly, advertising manager. More than 600 Goodrich sales representatives attended the divisional conferences.

Fountain Syringe for Travel

Miller Rubber Co. division of the Goodrich company has announced a compact, full-capacity fountain syringe manufactured by the Anode process, and designed expressly for travel. It is practical and complete in every detail, yet has the delicacy of fine toilet accessories.

The syringe is packed in a leatherette case, moisture-proof and durable, and can easily be tucked into a traveling or overnight bag. It retails at a price to yield both jobber and retailer a substantial profit, yet will not be overpriced in comparison with the better line of rubber sundries, according to L. H. Mercer, manager of sundry sales of the Miller company.

Personnel Changes

The following changes in the mechanical rubber goods sales division were announced by Vice President and General Manager J. H. Connors of that division. W. S. Richardson, formerly staff superintendent, becomes merchandising manager, and is succeeded by J. B. Hanan.

Other mechanical goods sales managerships announced were: B. J. Brooks, operating manager; C. F. Conner, sales promotion manager; and A. W. Doran, distributer sales manager.

Products sales managers are: L. H. Chenoweth, hose, tubing, etc.; E. R. Miller, molded goods; L. Q. Moffitt, cutless bearings; D. N. Hill, hard rubber; H. E. Fritz, chemical sales; R. McPeake, Diamond Rubber; P. W. Van Orden, belting; E. Peterson, rubber rolls; J. F. Johnston, Miller Rubber; W. Brown, Jr., Hood heel, sole, and sundries sales; J. Smith, Hood hard rubber and asphalt; and J. M. Failey, miscellaneous products sales. C. E. Cook is general sales manager of the division.

J. A. Hoban, merchandise manager of Goodrich Silvertown, Inc., has been made manager of the Goodrich pneumatic tire sales division, working directly under W. C. Behoteguy. The Silvertown vacancy was filled by R. C. Douglas, formerly manager of store development of Goodrich Silvertown.

The following changes affecting Miller, Hood, Diamond, Brunswick, and Defiance tire divisions, subsidiary sales organizations of the Goodrich company, were recently announced by H. E. Keller, manager of the subsidiary tire division, effective October 15. Territorial organization follows: V. C. Criswell, manager eastern division; C. L. Campbell, manager central division; C. E. Carroll, manager western division; and K. K. Kantzer, manager Pacific Coast division. Akron office reorganizations include: E. P. Weckesser, special tire and tube accounts; A. L. Bowman, truck and bus tires; E. A. Schneider, Miller and private brand accessories; and C. W. Landefeld, operating, clerical, and statistical.

Willard C. Gulick, Goodrich representative in the Hawaiian Islands for a number of years, returned late last month to Akron to take up duties in The International B. F. Goodrich Corp., export division of the company. N. F. Weber, who spent four years with the export division in New York and recently in Akron, has left to assume the island position.

Employment Manager A. C. Sprague recently announced that 20-year service pins were awarded to the following: Thomas J. Martin, Goodrich mechanical goods sales; John Mossop, Miller mechanical goods sales; Ferdinand Meurin, southwestern district sales; J. Spach, Société Française, B. F. Goodrich, Colombes, France; Otto Geske, processing division; John C. Rich, mechanical division; and Eddie Stemple, tire division.

Cincinnati Belting Co., 203 Main St., Cincinnati, handles rubber belting and hose. Henry Stagnaro is purchasing agent.

Sears, Roebuck & Co. appointed H. F. Murphy manager of its stores in the Ohio district with headquarters in Cleveland. He will have charge of merchandising, operating, sales promotion, and advertising of the company's seventeen stores in Ohio.

Tire Price Conference

A conference of leading rubber manufacturers held in New York in September was resumed during the latter part of October in Cleveland. Two of the largest mail order houses, Sears, Roebuck & Co. and Montgomery Ward Co. are said to have been represented. Price cutting, from which the rubber industry suffers seriously, especially the tire division, is one of the important topics to be settled. The maintenance of tire prices is an outstanding result to be hoped for from the conference.

Seiberling Rubber Co., Akron, through an official of the company, recently announced that no reduction in either wages or working hours were contemplated at this time. October production schedules called for continued operation of the plant on four six-hour shifts, except for a short shutdown to allow for taking inventory before the close of its fiscal year, October 31. Sales to dealers are reported ahead of last year and the volume of orders received leads the company to believe that it will continue to operate at a highly favorable rate.

President F. A. Seiberling accompanied by his son, J. Penfield Seiberling, and Harvey B. Stout, factory representative, are on a 19,000-mile tour, which began October 4 and is expected to end several days before Christmas, visiting practically every key city in the country to talk to more than 4,000 tire dealers. The trip is being undertaken to introduce the new Seiberling duotread air-cooled tire, which will be personally introduced by Mr. Seiberling in a series of dealer meetings. He will explain the tire's construction, point out its various features, and advise his dealers on the most practical methods to be employed in merchandising this product. His son, who is also his assistant, will speak on the market for Seiberling products and will explain how the manufacturer and the distributer may work together. Harvey B. Stout will present dealer development plans and the company's program for wider distribution.

This photograph shows one of two 1,115 ft. 54 in. 8-ply Record Maker Conveyer Belts recently made by The Republic Rubber Co. as part of a large order covering equipment for the new plant of the Thunder Bay Quarries Co., Alpena, Mich. This individual belt, when packed for shipment, weighed 23,475 pounds.

NEW JERSEY

Rubber manufacturers in New Jersey, reporting a general increase in business during the past month, are much encouraged over the outlook. Some plants have increased working hours. A few factories, however, announced a falling off in orders for certain goods. Production of rubber shoes and heels has taken a spurt over last month; while factories producing rubber cloth are operating normally. The hard rubber situation remains the same.

Lambertville Rubber Co., Lambertville, again is operating five days a week after facing a dull season during the latter part of the Summer. The company has some good sized orders on hand.

Milton H. Martindell, vice president and secretary-treasurer of the Joseph Stokes Rubber Co., Trenton, visited the company's plant at Welland, Ont., Canada. He reports increased business at both the Canadian and the New Jersey factories.

Puritan Rubber Co., Trenton, finds orders increasing and expects production to be on a par with that of the two previous months.

Essex Rubber Co., Trenton, states that business has become more active with output increasing over that of the previous two months. Officials are encouraged by the outlook.

Whitehead Bros. Rubber Co., Trenton, reports increased business with the plant operating five days a week on an eight-hour basis.

Pocono Rubber Cloth Co. is running on a normal basis. Prospects are good for the Winter.

Alfred H. Branham, vice president and receiver of the Murray Rubber Co., Trenton, was on an extended business trip through the South.

Rubber Manufacturers' Association of New Jersey held its fall meeting and dinner at the Trenton Club, Trenton, October 6. Following the dinner came a general discussion on the rubber situation.

Thiokol Corp., Yardville, announced that Frank Kovacs, formerly development manager of the Seiberling Rubber Co., Akron, O., has been appointed Thiokol vice president and development manager. He joined the corporation in December, 1930.

New Jersey Rubber Co., Lambertville, has asked the Lambertville City Commission to reduce the taxes on its plant while the factory is idle. The company closed down some time ago and will not reopen until the rubber situation improves.

Edgar W. Hunt, president of the Edgar T. Phillips Memorial Hospital Fund, announces that plans to build a hospital in honor of the late rubber manufacturer have been abandoned. Enough money was left to build a hospital, but the committee lacks funds to maintain it. Mr. Phillips was formerly an official of the Crescent Insulated Wire & Cable Co., Trenton.

Horace T. Cook, president of the Acme Rubber Co., and the Hamilton Rubber Co., Trenton, has returned with Mrs. Cook from Fisher's Island, where they spent some time.

Hamilton Rubber Mfg. Co., Trenton, lost its suit with two other rubber concerns, the Birmingham Tire & Rubber Co., Birmingham, Ala., and the Cupples Co., St. Louis, Mo., in a claim for $17,907 from three stockholders of the United Tire Stores, Inc. The stockholders are Maco Stewart, Sr., Galveston Co., Tex., Maco Stewart, Jr., and Elmo C. Tenison, both of Dallas, Tex. The original suit was filed in the Federal District Court at Dallas, and the United States Supreme Court on October 12 refused to review the claim. The Stewarts denied responsibility on the ground that they had withdrawn from the United Tire Stores before the transactions in the judgments occurred. Mr. Tenison declared he was not involved as he paid for stock in merchandise and accounts. The firms holding the judgments took the position that the Stewarts had sworn they had advanced cash for their stock. In addition it was claimed that the stockholders were liable under laws in Texas.

The Thermoid Co., Trenton, is very busy in the hose department, but orders for brake lining decreased during the past month. Some employes are working four days a week.

Pierce-Roberts Rubber Co., Trenton, which had been on a five-day week, added another half day because of increased orders. The press room has been busy during the entire Summer. The company announces that it will shortly produce a new article, plans for which are now being made.

Carl S. Williams, formerly rubber research director at the Perth Amboy plant of The Roessler & Hasslacher Chemical Co., has become a member of the rubber technical staff of E. I. du Pont de Nemours & Co., with headquarters in the rubber laboratory of that company at Penngrove, N. J.

The Grasselli Medal has been awarded for 1931 to Dr. L. V. Redman, of Bloomfield, N. J., vice president and director of research, the Bakelite Corp. This award may be made annually for the thesis offering the most useful suggestions in applied chemistry, which has been presented before the American Section of the Society of Chemical Industry, or at any joint meeting of the section with other scientific societies, during the preceding five years. Selection of Dr. Redman was based on industrial studies in a paper on "Cost of Research and Its Apportionment" delivered at a joint meeting on December 9, 1927. The medal will be bestowed at an assembly of the chemical societies of the New York area on November 6.

Frederick J. Maywald, consulting rubber chemist, with laboratories at 305 Hoboken Road, Carlstadt, specializes in chemical work and in solving manufacturing problems for the rubber trade on a monthly fee basis.

MIDWEST

United States Rubber Co., Tire Department, Detroit, Mich., through General Sales Manager L. M. Simpson, announced the appointment of M. C. Bacon as special sales representative for puncture sealing tubes. Mr. Bacon has had fourteen years' experience with this product, having been with the McWade Automatically Sealed Tubes, Garrettsville, O., and later with the Poulson Rubber Co., which took over its business. He comes to U. S. Rubber directly from the Poulson Co.

Some 700 United States tire dealers and their guests were included in the 2,000 welcome friends, customers, and visitors who witnessed the great parade of the American Legion from the windows of the big United States tire plant on E. Jefferson Ave. during the recent convention of the Legion. On that day the company declared a holiday for its entire forces to enable them to see the parade, at which time refreshments were served.

Independent Rubber Co. recently moved to larger quarters with increased facilities at 665-67 W. Washington Blvd., Chicago, Ill. Telephones: Monroe 2022-23-24.

Russell L. Colley, Goodrich development engineer, was one of the speakers to address the 20th annual congress of the National Safety Council in Chicago last month. His subject was on the new Goodrich product which eliminates ice from airplanes in flight. Other speakers who addressed the meeting were: W. L. Schneider, Goodrich engineer; H. W. Low, Miller Rubber Co. engineer; and Dr. J. Newton Shirley, who is examining physician of The Hood Rubber Co., Watertown, Mass.

National Tire Dealers Association, Inc., 100 North La Salle St., Chicago, Ill., will hold its twelfth annual convention at Hotel Statler, Detroit, Mich., on November 16 to 18. Among the speakers scheduled to address the convention are: H. S. Burdette, of Goodyear Tire & Rubber Co., whose subject will be "Tire Dealers' Rim Problems"; Martin O'Neill, manager dealer relations, Firestone Tire & Rubber Co., who will talk on "Tire Sales from a Super Service Standpoint"; President F. B. Davis, of the United States Rubber Co., who may possibly speak in the place of J. F. O'Shaughnessy, who is in charge of all tire operations in the United States for the U. S. Rubber Co.; and S. B. Harper, director and past president of the N. T. D. A., whose subject will be "Opportunity of the Independent Dealer." A discussion on "Truck and Heavy Duty Tires" will also be conducted by National Secretary Norval P. Trimborn, who in past years has developed such fine discussions on the big commercial sizes. J. D. Tew, president of the Rubber Manufacturers Association, and President Martin J. Barry of the N. T. D. A., will be guests of honor at the annual banquet and entertainment.

EASTERN AND SOUTHERN

R. M. A. Meeting and Dinner

The Rubber Manufacturers Association will hold its annual meeting and dinner at the Waldorf-Astoria in New York, N. Y., on January 11. Full particulars will be published in our next issue.

A. Schrader's Son, Inc., Brooklyn, N. Y., announced that prices of all bent and double bent truck valves shown on its price list of September 1 are based upon these valves being equipped with No. 880 valve caps. Practically all bent truck valves previously supplied are equipped with No. 5041 valve caps. These valves, when so supplied, will cost the dealer about 9 cents more each.

Wishnick-Tumpeer, Inc., 251 Front St., New York, N. Y., recently announced the addition of Frederic V. Larkin, long associated with the rubber industry in this country and abroad, to its staff as technical representative in the eastern part of the United States and Canada. He formerly represented the Roessler & Hasslacher Chemical Co., Rubber Division, for the past seven years in a similar capacity. His headquarters are at the New York office.

National-Erie Corp., 16th and Raspberry Sts., Erie, Pa., manufacturer of steel castings, gears, coal cutting machinery, and rubber factory equipment, after a reorganization will resume operations at its plant which was shut down on August 19. A. Hunter Willis, former president of the company, has been succeeded by William J. Johnson, of Pittsburgh, Pa. B. L. Weaver, of New York, N. Y., continues as vice president and treasurer, and Henry E. Scott, of Erie, as secretary and assistant treasurer.

The Labor Department in its monthly report on industrial employment announced that employment in the fifteen industrial groups showed an increase of 0.8 per cent in September over August while the earnings of workers included in the groups declined 2.8 per cent partly because of the Labor Day holiday. Twenty-four of the fifty-four manufacturing industries reporting more employes in September than in August included boots and shoes, which rose from 62.4 in August to 69.5 in September—earnings of workers increasing from 51.8 in August to 57.1 in September. Tires and tubes averaging 69.4 in August in employment decreased to 67.3 in September, payroll totals also decreasing from 58.0 to 48.1.

Certain-teed Products Corp., 100 E. 42nd St., New York, N. Y., on August 1 sold its Floor Covering Division and is no longer engaged in manufacturing hard surfaced floor coverings.

Carolina Rubber Hose Co., Salisbury, N. C., manufactures railroad hose and rubber roll covering for textile finishing plants. Miles J. Smith serves as president, treasurer, and purchasing agent; while Harry R. Ferguson acts as secretary.

G. D. Bowne

G. D. Bowne, Manager of New Electrification Division

G. D. Bowne, manager, general mill electrification division, Industrial Department, Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa., was born in Hartford, Conn., and graduated from Trinity College with the degree of B.S. in science in 1906. In that year he entered the apprenticeship course of the Westinghouse company where he spent a year and a half, leaving to take a special engineering course at Columbia University. He joined the industrial sales department of Westinghouse's Boston office in 1908, and four years later was placed in charge of the textile industry. Since 1925 he was also assigned to specialize in paper mill and general mill electrification. The duties of Mr. Bowne include the following customer classifications: cement products, rubber, leather, paper, textiles and woolens, glass, food and tobacco products, wood products, and the logging and lumber industry.

H. Muehlstein & Co., Inc., 41 E. 42nd St., New York, N. Y., has moved into more desirable quarters on the 17th floor at the same address. The new offices are in every way better suited for convenience in the transaction of the company's business in crude rubber, rubber scrap, etc.

W. O. Rutherford, president of the Pennsylvania Rubber Co., Jeannette, Pa., in a recent open letter on the rubber situation called for an upward revision of tire prices and pictured the benefits derived from such an increase.

Charles A. Cannon, Concord, president of the Cannon Mills, Inc., Kannapolis, both in N. C., a large textile manufacturing corporation, has been elected a director of the New York Life Insurance Co. to fill the vacancy created by the death of Richard I. Manning, former Governor of South Carolina.

Salvage and Reclamation Division of N. A. W. M. D.

The Salvage and Reclamation Division of the National Association of Waste Material Dealers, Inc., on October 27 and 28, held a conference at the plant of the General Electric Co., Schenectady, N. Y., which acted as host to members of the division group and their guests. The conference considered problems in connection with salvage and reclamation operations in large industrial plants. Papers were presented on important subjects involving not only the disposition of waste materials but the question of keeping industrial plants clean from surplus and obsolete equipment.

R. W. Phillips, manager of the Salvage and Reclamation Division of the du Pont company, is chairman of the group, and C. H. McKnight has charge of the details for General Electric.

On October 27, members and guests were tendered a dinner at the Van Curler Hotel by General Electric, and were addressed by officials of that company.

F. Lester Kittle, Inc., 24 Stone St., New York, N. Y., direct importer of liquid latex, through Fred Horn, reports an increased business in this commodity and that its field and uses are unlimited. Last year ten million pounds of liquid latex were imported into this country, and it is predicted that the 1931 importations will be tripled. R. C. Lepper, eastern representative for the Firestone Tire & Rubber Co. for the past 10 years, has gone to the Far East in the interests of F. Lester Kittle, Inc.

The Roessler & Hasslacher Chemical Co., Inc., announced that within the past three months the following members of the research staff have been transferred from the plant at Perth Amboy, N. J., to the Niagara Falls, N. Y., plant: Drs. Sterling Temple, B. S. Lacy, A. M. Muckenfuss, J. F. Reichert, and C. J. Wernlund, A. T. Hawkinson, A. W. Rudel, J. M. Wainscott, H. A. Bond, P. M. Paulson, patent specialist, and M. Marean, librarian. I. L. Ressler, entomologist, has been transferred from New York to Niagara Falls.

Charles H. Bauer, for the past six years manager of the Automotive Division of the L. H. Gilmer Co., Philadelphia, Pa., has been appointed general sales manager. Through intensive merchandising methods coupled with a natural ability for efficient sales organization, Mr. Bauer has greatly broadened the company's automotive business and brought it to its present international standing. His contacts, both in the industrial and automotive field, have been and are so numerous that he has become internationally known as a merchandising authority. Mr. Bauer is International President of the Automotive Boosters Clubs, which numbers some 1,200 manufacturers' representatives, and a member of the Board of Counsellors of the Motor and Equipment Association.

Charles E. Wood, president of Charles E. Wood, Inc., crude rubber importer, 21 West St., New York, N. Y., after an extended trip abroad, was optimistic over the prospect of restriction of crude rubber production and improvement in prices. He believes that unless there is some way of helping the rubber planter, the forests will be allowed to grow into a wild state. This condition will mean less rubber trees and, eventually, very much higher prices.

Testing Machines, Inc., 314 Broadway, New York, N. Y., is the new name of the company formerly known as H. Z. Schniewind, seller and distributer of the Schopper materials testing machines. Schopper will be represented in the rubber and insulating materials, textiles, paper, and metal fields. H. Z. Schniewind is president of the new company, and J. H. Eaton, vice president. It was also announced that a new catalog of the most up-to-date rubber testing machines is now ready for distribution.

Vulcanized Rubber Co., Morrisville, Pa., is experiencing much improved business in all departments. Prospects for the Winter are very encouraging.

The Monsanto Chemical Works and **The Rubber Service Laboratories Co.,** its subsidiary, joined in filing a suit against Kavalco Products, Inc., a corporation, and C. Olin North and Winfield Scott, all of Nitro, W. Va., in the United States District Court at Charleston, W. Va. The suit is for an injunction and accounting based upon the alleged unlawful use of confidential manufacturing and sales information belonging to the plaintiff corporation.

Dunlop Tire & Rubber Corp., Buffalo, N. Y., through company officials announced that because of increased orders resulting from a sales drive, all employes have returned to a full-time working schedule to take place of the four-day-a-week schedule previously in force.

A. L. Viles, president of the Rubber Manufacturers Association, who is chairman of the Rubber Committee of the Emergency Unemployment Relief Committee's division of Commerce and Industry, issued a statement at headquarters of the committee, 29 Broadway, New York, N. Y., explaining how his division will operate in raising funds in Manhattan for the relief of acute distress resulting from unemployment in New York. The other divisions of the committee are: Special Gifts and Women's Committee.

Schwenk Safety Device Corp., manufacturer of safety handling equipment and carboys, moved from 70 E. 45th St. to 27 Water St., New York, N. Y. Telephone, WHitehall 4—9324. I. C. Goldman is president, M. E. Thayer, sales manager, and Melvin Pine, engineer.

A. C. Kruger, for the past seven years with Firestone Footwear Co., in charge of cement manufacture and development of latex uses, has joined the technical staff of Heveatex Corp., Malden, Mass.

NEW ENGLAND

H. W. Butterworth & Sons Co. moved its office from 1202 to 1409 Turks Head Bldg., Providence, R. I., to take care of the increasing demand for textiles which recently has been showing itself in New England.

Firestone Cotton Mills, Fall River, Mass., reopened early in October after one week's shutdown. Officials of the company resumed work under a 10 per cent reduction in salaries, but operatives who accepted a 5 per cent cut two months ago are continuing on the same pay basis as prior to the shutdown.

Bolta Rubber Co., Lawrence, Mass., manufacturer of hard rubber combs, completed negotiations with Lawrence Factories, Inc., for the purchase of mill building No. 3, adjoining building No. 3A, that Bolta has owned and occupied for two years. President John Bolten stated that increasing business necessitated more room and additional 250 workers, making a total of approximately 600 employes. The two five-story brick buildings contain 160,000 square feet of floor space. More than $100,000 in machinery is being prepared for operations early in January.

Ellison Tire & Rubber Co., 357 Broadway, Chelsea, Mass., local tire dealer, after having been in business for 20 years, recently conducted its first sale of tires featuring the popular Pennsylvania brand. Edward D. Ellison is owner, and his son, Harold, is associated with him in the business.

Dr. Harry L. Fisher, chief chemist of the United States Rubber Co., was the speaker at the October meeting of the Connecticut valley section of the American Chemical Society held at Thompson Chemical Laboratory, Williamstown, Mass.

Goodyear Tire & Rubber Co., Akron, O., awarded James A. Travers, 132 Brookline Ave., Boston, Mass., Goodyear dealer for 22 years, a beautiful art photograph framed in duralumin of the *U. S. S. Akron.* Mr. Travers wins the picture for making his sales quota in the July-August sales contest for Goodyear dealers, known as the dealers' annual Zeppelin sales race.

Converse Rubber Co., Malden, Mass., effective October 23, staggered employment at the plant to give a large number of persons part time employment during the Fall and the Winter.

Lester K. Munroe, assistant secretary and treasurer of the National India Rubber Co., Bristol, R. I., resigned, effective October 1. On September 13, 1909, he entered the employ of the company as timekeeper and payroll clerk, being promoted to accounting activities and then to bookkeeper, becoming chief accountant on January 1, 1917. Two years later he was appointed assistant treasurer and then assistant treasurer and assistant secretary. In addition to these duties, in November, 1929, he was made control manager in charge of all accounting, budget control, scheduling, purchasing, stores, and traffic.

W. L. Montgomery & Co., Inc., sole selling agent for Arlington Mills wool grease, on October 1 moved its offices from 10 High street to 89 Beach street, Boston, Mass.

Panther Rubber Mfg. Co., Stoughton, Mass., last month had more than 100 women and girl employes strike in protest at a 10 per cent reduction in wages, claiming that they were cut from $11.05 a week to $9.60, with other reductions in the piecework rates. Many of the employes returned to work following a conference with company officials. Frank Bernstein and Arthur Greenbaum, of the company, said the action of the employes was due to a misunderstanding. Both denied the figures given out by one of the employes, stating that the lowest wage paid to any girl was $15 a week.

Revere Rubber Co., 355 Valley St., Providence, R. I., a branch of the United States Rubber Co., last month filed with Secretary of State Ernest L. Sprague, an amendment to its articles of association, reducing the authorized capitalization of the company from $5,000,000 to $1,000. The amendment was signed by Edward J. Coughlin, president, whose office is in New York. The company formerly was authorized to issue $3,000,000 in preferred stock and $2,000,000 in common. The new capitalization is divided into 10 shares of common stock with a par value of $100. Local officials of the company were unable to explain the reduction.

E. C. Webster, president of the Traffic Club of New England and traffic manager of the Hood Rubber Co., Watertown, Mass., was toastmaster at the "marine dinner" at the Copley-Plaza Hotel. Mayor James M. Curley, of Boston, as guest speaker, hailing the slogan "Ship and sail from Boston," pledged his active support in furthering the commerce and industry of Boston.

Quality Products and Public Service Exposition, the fifth annual show, was held at the Copley Plaza Hotel, Boston, Mass., October 19-21, where many rubber interests were represented. The Hood Rubber Co., Watertown, showed a complete array of rubber sports footwear, giving special prominence to the Ike Walton sporting boot. Rubber floor tile formed the background of all the displays and created considerable interest. A special booklet, prepared in connection with a treasure hunt contest recently run in national magazines and newspapers of particular appeal to children, was distributed at its booths. The du Pont Viscoloid Co. had a very interesting display of its many attractive products.

Fisk Rubber Co.'s plant, Chicopee, Falls, Mass., last month ceased production for two weeks for inventory and generally clearing the way for production to meet next season's demand. It was deemed wiser to close outright for a definite period rather than go on short-time schedule.

PACIFIC COAST

Golf tournament. Many representative manufacturers and dealers from coast cities extending from San Diego to Seattle attended and enjoyed the twelfth annual golf tournament of the Pacific Coast Mechanical Rubbermen's Golf Association at the Rancho Golf Club near Los Angeles, Calif., October 5 and 6. The affair ended with a banquet. The results of the playing follow:

Qualifying round, low net: winner, W. A. Corder, Boston Woven Hose & Rubber Co. trophy; qualifying round, low gross winner, L. W. Winship, The B. F. Goodrich Rubber Co. trophy; championship flight: winner, T. D. Horan, Seattle Brass & Plaque Co. trophy; runner up, M. S. Sprague, W. C. Hendrie & Co. trophy; championship flight defeated four: winner, L. W. Winship, Los Angeles Rubber & Asbestos Works trophy; first flight: winner, C. D. Clawson, J. B. Lippincott trophy; runner-up, H. Jensen, Electric Hose & Rubber Co. trophy; first flight defeated four: winner, J. A. Galway, Goodyear Tire & Rubber Co. trophy; qualifying: second low gross, Walter Cox, Pioneer Rubber Mills trophy; second low net, T. A. West, Paris Inn Cafe trophy; driving contest: winner, L. W. Winship, Colt's Patent Fire Arms Co. trophy; second prize, M. S. Sprague, U. S. Rubber Co. golf cape; putting contest: winner, T. D. Horan, Kirkhill Rubber Co. trophy; second prize, L. W. Winship, U. S. Rubber Co. golf cape.

Pacific Hard Rubber Co. was organized in October to manufacture hard rubber storage battery containers. Its plant, which will have a daily capacity of 1,000 containers, will be located on the property of the Stauffer Chemical Co. at Vernon, adjoining Los Angeles, Calif., and will start production on or about February 1, 1932. General offices will be maintained in the Rives-Strong Bldg., Ninth and Main Sts., Los Angeles. Officers are: President, John Stauffer, Jr.; vice president, Herbert King; secretary-treasurer, Wm. C. King. The new company will be closely affiliated with the United Rubber Corp., San Francisco, Calif., founded by Herbert King, in which John Stauffer, Sr., became a director last June. This company is very busy making hard rubber covers, vent plugs, rubber bushings, and composition battery boxes.

Firestone Tire & Rubber Co., Los Angeles, Calif., which had decided to make at the latter place a full line of storage batteries for the west coast field instead of supplying it from the parent plant in Akron, O., started its preparatory units October 20 and expects to be on full production November 2. Instead of erecting a new factory, the company is utilizing two floors of a wing of the Xylos Rubber Co. reclaiming plant and has installed over $200,000 worth of special equipment for battery making. The plant will have a potential capacity of 1,200 standard batteries daily, and the products will be designed chiefly for the replacement trade. The Xylos concern has ample room for its reclaiming work, and demand for its products keeps it running on a 24-hour-a-day schedule. Homer G. Allen, general manager of the Xylos plant, will also be in charge of operations in the battery factory. The new enterprise, as well as the big tire plant adjoining, was inspected last week by Executive Vice President J. W. Thomas of the parent company. H. D. Tompkins, manager of the truck and bus department of the Los Angeles tire plant, returned last week from Atlantic City, N. J., where he attended the annual A. E. R. A. convention, later conferring with Firestone sales executives in Akron.

The B. F. Goodrich Co., Akron, O., through General Tire Sales Manager C. B. O'Connor, recently announced the appointment of Harry M. Baker, former special representative of the retail division of the company, as district manager in Seattle, Wash. Mr. Baker joined Goodrich in 1914, serving as credit manager in the Boston and San Francisco branches, and in 1921 was made branch manager in Minneapolis, later becoming district manager in the same territory. In 1923 he became zone manager on the West Coast for Brunswick tires, a subsidiary division, and in 1926 was appointed manager of the sales personnel department in Akron.

Desser Tire Products, founded and owned by Irwin M. Desser, has moved its main offices from 4414 Long Beach Ave., Los Angeles, to 6211 Cottage St., Huntington Park, both in California. The concern started accumulating scrap rubber eleven years ago and is said to have the largest stock of that material in the Southwest. It is also a heavy shipper of scrap rubber to Europe and the Orient. Recently Mr. Desser acquired land and buildings adjacent to the Huntington Park plant and has begun building rebuilt and retreaded tire casings, for which up-to-date equipment has been installed. Since July, it is said, sales have grown steadily each month. Boots, reliners, and various by-products are also being made. A six-day-a-week working schedule is maintained. P. F. Mekeal is in active charge.

Goodyear Tire & Rubber Co., Los Angeles, Calif., announces that the name of Motor Tires, Inc., main distributer of Goodyear tires has been changed to Goodyear Service, Inc., with the chief of the twenty Southwest stores at 1415 E. Ninth St., Los Angeles. P. K. Coe will continue as president. With C. H. Williams, manager of the tire making plant, he recently attended the annual conference of Goodyear branch managers at the parent plant in Akron, O. A recent visitor at the local plant was L. O. Ginther, manager of the Goodyear aeronautical department at Akron. Fred Harris is now advertising manager, replacing W. Visel, who has been transferred to the service department.

Southwestern Rubber Co., owned by F. J. Keefe, which manufactures camelback and other tire repair stock in a new building of its own at 651 S. Anderson St., Los Angeles, Calif., reports excellent business. The demand for repair material seemingly is little affected by the low prices for new tires.

Coast Tire & Rubber Co., Oakland, Calif., continues to hold its trade well despite strong competition from tire manufactories with nation-wide distribution, and the outlook is regarded as promising. Advantages which have favored the company are said to be conservative management, minimum overhead, and economical distribution through its own branches at leading points on the Pacific Coast.

United States Rubber Co.'s Samson Division plant in Los Angeles, Calif., reports well maintained business during the recent general let-down in tire selling, that inventory has been kept down to bed-rock, and that a schedule calling for a steady increase each month will be started November 1. Field reports from practically every part of the Pacific Coast field are very encouraging. Recent visitors who have been making a close study of operations have included Earl Bryant, assistant general manager of the tire division, and Sidney M. Cadwell, director of development, both of the main plant in Detroit, Mich., and Vice President L. D. Tompkins of New York, N. Y.

Pacific Goodrich Rubber Co., Los Angeles, Calif., is proud of its safety record, said to be unique among tire factories. It has run 224 days without one lost-time accident. A safety campaign has been in progress many months, and the good work accomplished is indicated by the fact that while ten accidents occurred last year, only two occurred in ten months of this year. Plant Superintendent Fred A. Nied has offered a prize to the department that will come through without an accident by next March, and 800 production men are competing. General Sales Manager Frank E. Titus, back from the Northwest, reports prospects very good. E. W. Show, manager of Silverton, Inc., Coast sales agency, has returned from the parent Goodrich plant in Akron, O. T. H. Farrington, who replaces Vice President and General Manager Samuel B. Robertson, arrived from Akron last week. The annual Coast sales conference will be held at the Los Angeles factory November 4 and 5.

Sherco Rubber Co., which produces inflatable rubber seats and various specialties at its Norwalk, Calif., factory, has changed its Los Angeles, Calif., office from 1018 S. Hill St. to 414 Wilcox Building.

The Patterson Foundry & Machine Co., E. Liverpool, O., opened its San Francisco office in the Rialto Bldg., with Edgar S. Browning in charge as district manager. Mr. Browning is well known in the chemical, paint, and ceramic centers, having been with the Pittsburgh Plate Glass Co. for many years.

CANADA

Although rubber companies announced hockey puck prices some time ago, circumstances arose effecting a revision. Reductions were made and new quotations became effective last month.

Dealers note increasing demand for weatherstripping, so a real brisk consumer market should be under way shortly. The usual good demand for this commodity is expected, and it is not thought sales will be affected to any great extent by economic conditions. Prices are a shade higher than last year, owing to the additional sales tax.

United Tire Stores, Montreal, P. Q., last month held a convention for its executive personnel, branch managers, and salesmen. A. S. Murphy, Montreal branch manager for the Seiberling Rubber Co. of Canada, Ltd., Toronto, Ont., was chairman. J. A. Thompson, advertising manager for Seiberling in Canada, outlined sales and advertising policies for 1932 and led a discussion on the products to be placed in tire dealers' hands. This meeting followed closely a convention of 100 dealers held in Toronto, which was addressed by Frank A. Seiberling, president of the Seiberling Rubber Co., Akron, O., U.S.A., as well as of the Canadian company. Accompanying Mr. Seiberling was his son, J. Penfield Seiberling. Mr. Thompson left for Ottawa to meet C. A. Jones, vice president and general manager of the Canadian Seiberling company. There they will conduct a similar meeting with the sales force of their distributer, Service Supplies, Ltd. Mr. Thompson declared that Seiberling dealer sales have kept up remarkably well this year, and the company, for the coming year, anticipates greater results.

E. W. BeSaw, president of the Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., discussing the current situation, said in part: "As far as the outlook for 1932 is concerned, it will naturally show improvement over 1931. Just how much is problematical. Statistics indicate that there will need to be an increase of foreign trade, a reduction in the cost of living, higher automobile production and more building.

"Firestone in Canada was never in a better position. The past year has been very satisfactory both regards sales and profit. We have improved our manufacturing facilities, increased the strength of our sales organization, spent more money on advertising in 1931 than we did in 1930, and expect to increase our appropriation for 1932."

Seiberling Rubber Co. of Canada, Ltd., recently held its annual convention in the Royal York Hotel, Toronto, Ont. C. A. Jones, general manager, presided, and factory representatives as well as branch managers and salesmen from Winnipeg, Man., Montreal, P. Q., and Toronto attended. W. S. Wolfe, first vice president in charge of production of the Seiberling Rubber Co., Akron, O., U.S.A., spoke on production and sales. Business discussions were led by Mr. Jones; M. L. Brown, factory manager; J. A. Thompson, advertising manager; R. J. Thomas, treasurer; P. H. Dee, credit manager; W. H. ("Si") Hodgins, in charge of druggists' sundries; N. Rian, in charge of adjustments; and P. G. Davies, in charge of the accessories and repair materials department. After the business sessions the delegates made a tour of the Seiberling factory in Toronto, following which they went to the Rouge Hills Golf Club.

Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont. The Quebec and the Ottawa district sales organizations held their annual fall sales convention at the Windsor Hotel, Montreal, P. Q., on October 10. After luncheon R. G. Reid, of A. McKim, Ltd., advertising agency, delivered an address. Features of the general sales discussions were talks by Colonel Paul R. Hanson, division manager for the Province of Quebec; P. E. Temple, sales manager for the Quebec tire division; E. E. Williams, manager of the Ottawa branch; and E. C. Martin, general sales manager of the Dunlop organization, Toronto, Ont., who was accompanied by E. G. Skirrow, advertising manager, also of Toronto.

After paying preferred dividends regularly during the years of depression Dunlop directors decided to take no such action for the current quarter. In a letter to shareholders the board explained it had considered dividend payments in the last two years advisable because of the excellent financial condition of the company, "even though the dividend had not been earned during the second year." But now it appears unwise to continue paying unearned dividends into the third year of depression.

P. & W. Mfg. Co., Ltd., Toronto, Ont., has been granted a charter to manufacture, buy, sell, import, export, and generally deal in utensils, lubricants, rubber, and articles and goods of all kinds, of which rubber is a component part. Capitalization consists of 25,000 preferred shares, par value $10 each, and 25,000 shares without par value.

Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., C. H. Carlisle, president and general manager, in a letter to shareholders says in part: "During the quarter just closing, considering general business conditions, your company has made a satisfactory profit each month of the quarter. It is difficult to forecast business conditions, but we anticipate that we will close our fiscal year on December 31 with at least as satisfactory a profit as that of a year ago. In my letter of June 30 I gave you information as to the financial standing position of your company. During the past quarter we have slightly improved our position as compared with that date. The Canadian rubber industry during the nine months' period of the calendar year has shown a decrease, as compared with the same period of a year ago, of 24.9 per cent."

Lord Trenchard, newly appointed Commissioner of the London Metropolitan Police and, therefore, chief of Scotland Yard, is visiting Canada and also intends to look over the Goodyear Tire & Rubber Co. plant at Akron, O., U.S.A.

Dominion Rubber Co., Ltd., Montreal, P. Q., recently issued a new 32-page catalog of rubber footwear that has been specially prepared for the sorting season. It includes heavy rubbers for men and a range of galoshes, light rubbers, etc. The outstanding number is the new 'Silhouette," an all rubber Gaytee, a self-fitting, lightweight, galosh of slip-on type without buckle or slide fastener. It is so designed that it can easily be pulled on by the wearer, and presents a very neat appearance. It has a stretchy fleece-lined vamp and worsted brown net quarter. The upper is run on a fancy engraved roll, in black and brown.

M. L. Douglas, general sales manager of the Tire Division of the Dominion Rubber Co., Ltd., Kitchener, Ont., uses an airplane to keep in close touch with his field force across Canada. Mr. Douglas, the first "flying sales manager" in the Dominion, intends to use his plane regularly and plans to equip it with skis so that winter weather will not interfere with his cross-country travels. He is no stranger to aviation although up until two months ago he had not been flying for twelve years. For nine years following the war, Mr. Douglas was director in charge of sales for the Dominion company in England, then he returned to Canada.

Gutta Percha & Rubber, Ltd., Toronto, Ont., after being downtown for forty-eight years, moved its head offices and Toronto branch to its factory in Parkdale to bring together more closely the administrative, sales, and production staffs. New modern offices have just been completed. Because of this change, it is claimed, its customers will receive even better service than in the past. The entrance to the new general administrative and sales offices will be at the head of West Lodge Ave.

An interesting feature of this firm's exhibit at the recent Canadian National Exhibition in Toronto was a monster rubber heel, possibly the largest that has ever been manufactured, weighing 193 pounds, 12 ounces. Its weight was made the subject of a guessing contest, which aroused considerable interest; 38,412 guesses were submitted, four of which were correct. There were 76 prize winners; not one was more than 9 ounces out. Rubber footwear was the prize, the winners having the choice of any line the firm makes. The heel in question represents a new model on which the name Maltese Cross has been replaced by the initials, "G. P." It has a new non-dirt catching design.

OBITUARY

John Kearns

Veteran Rubber Executive

DEATH removed a long-prominent figure from the ranks of rubber executives on September 24 when a fatal heart attack seized John Kearns while aboard the *S. S. Sonoma* en route to Australia. Mr. Kearns, retired at the time, boasted an enviable record in the rubber industry. His last active connection was as vice president and general manager of the Lee Tire & Rubber Co., Conshohocken, Pa., which he joined in 1916 to remain almost a decade.

He was born in Maine in 1857. Later his family moved to Boston, Mass., where he attended school, graduating from Comer's Commercial College.

In 1879 he entered the employ of the Boston Car Springs Co. The Overman Wheel Co., Chicopee Falls, Mass., won him over in 1891 to superintend the manufacture of bicycle tires. He resigned as foreman in 1898 to join the India Rubber Co., Akron, O.

At the beginning of the new century, however, he received a very attractive offer from the Dunlop Rubber Co., Melbourne, Australia; so John Kearns went to Australia. Even there his ability gained him many advances; his personality, a host of friends.

He returned to Chicopee Falls in 1913 to become vice president and later, also, head of the research department of the Fisk Rubber Co. After three years he went to Lee of Conshohocken.

Mr. Kearns was a familiar figure in community activities. While in Conshohocton he organized the Athletic Club, took an active interest in local sports, and long was an official of the community center. Besides he served as a director of the Conshohocken Trust Co. and the Matsonford Building & Loan Association. He was, too, a member of the Penn Club, a past Grand Knight of the Knights of Columbus, a former member of the Manufacturers' Club, Philadelphia, Pa., and at one time chairman of the Tire Division of the Rubber Association of America. He was also one of the first subscribers to INDIA RUBBER WORLD.

Funeral services and temporary interment took place at Melbourne on September 30. The remains, however, will be brought to Springfield, Mass., for burial in the family plot. Surviving Mr. Kearns are one brother, a sister, three sons, and a daughter.

Originator of Bureau of Standards

WHILE dictating a tribute to Thomas A. Edison on October 18, Dr. Samuel Wesley Stratton, chairman of the corporation and former president of the Massachusetts Institute of Technology, ex-director of the Bureau of Standards, and noted physicist, died suddenly at his home, Back Bay, Boston, Mass.

He was born on a farm in Litchfield, Ill., on July 18, 1861, and later developed into an expert mechanic and carpenter. He worked his way through the University of Illinois, from which he was graduated in 1884 with a degree of B.Sc., in mechanical engineering. Dr. Stratton taught at his Alma Mater and then at the University of Chicago.

Feeling the need of standardization and research in American industry, Dr. Stratton in 1900 finally interested Secretary of the Treasury Lyman J. Gage in a bureau of standards, a plan which Congress adopted the next year. Dr. Stratton, appointed head of the bureau, remained with it until 1923, when he became president of M. I. T. He resigned that position in 1923 to serve as chairman of the corporation under a new organization of the Institute.

The deceased was a bachelor and belonged to many clubs. During the Spanish American War he served in the Navy. During his lifetime he was the recipient of many high honors for his great work.

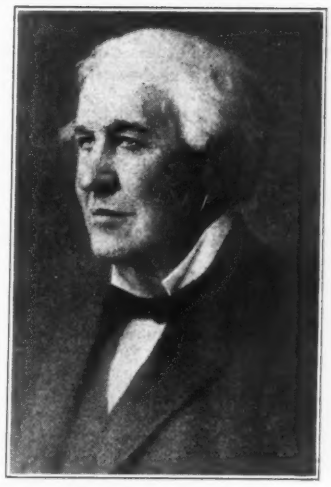
Funeral services were held on October 21 in Trinity Church, and noon the same day memorial services were conducted at the Institute for the faculty and staff. Interment was in Pasadena, Calif.

Inventor of Plastometer

HEART disease caused the death, on October 6 at his home in Wilmington, Del., of Benjamin D. Coppage, engineer and inventor of the plastometer, the criss-cross bearing, and many other devices. His plastometer won him the Franklin Institute Certificate of Merit.

Mr. Coppage was born in Sudlersville, Md., sixty years ago. His business career began as an engineer with the Baldwin Locomotive Works, Philadelphia, Pa. Later he was associated with the Pusey & Jones Shipyard and the du Pont interests in Wilmington. He was designing engineer for the Viscose Co., Marcus Hook, at the time of his death.

Funeral services for the deceased, who is survived by his widow and a daughter, took place on October 9, with interment at Sudlersville.



Thomas A. Edison

Renowned Inventor

THOMAS ALVA EDISON is dead. The world-famous inventor passed away at his home, Llewellyn Park, West Orange, N. J., on October 18, after a long illness resulting from complications of diseases. The inventions of Mr. Edison are internationally known and too numerous to mention. Of late years, however, in the interests of his cronies, Henry Ford and Harvey S. Firestone, Sr., president of the Firestone Tire & Rubber Co., Mr. Edison devoted many experiments to cultivating rubber in the United States, especially from golden rod. His inventions in the electrical field, moreover, greatly increased the use of rubber.

He was born on February 11, 1847, in Milan, O. Seven years later the family moved to Port Huron, Mich., where Thomas Edison attended school for three months, his only formal education. He tried many business activities, with much success, before embarking on the work that was destined to bring him world renown and the homage of nations.

The body rested in state in Edison's favorite spot, his laboratory, where on October 21, the fifty-second anniversary of the incandescent lamp, one of his greatest gifts to mankind and a perpetual tribute to his genius, funeral services were held. Burial was in Rosedale Cemetery, Orange.

Surviving the electrical wizard are his widow, who is his second wife, four sons, two daughters, and four grandchildren, besides several other relatives.

Firestone Branch Manager

ON OCTOBER 12, a month after an operation, Robert A. Smith, 32, manager of the Firestone Tire & Rubber Co., branch, Lima, O., passed away at the Lima City Hospital. Mr. Smith was an ex-marine and a member of the University of Pittsburgh freshman football team in 1923.

Funeral services were at Lima, October 14, and burial at Youngstown, O. Surviving are his widow and his parents.

Veteran Superintendent

AUGUST HENRY C. KORENGEL was born on December 31, 1857, in Hardegsen, Hanover Province, Germany. At the age of 73 he passed away quietly at his home, 930 Lorel Ave., Chicago, Ill., on October 11, 1931.

Mr. Korengel enjoyed the best educational advantages of his native country up to the age of thirteen years. At that time, 1870, he came to America and attended school in Pittsburgh, Pa., for one year. He then went back to Germany for several years and then came over a second time, in 1878, making his home at Oil City, Pa.

In 1880 he was married to Fredericka Johanna Beller, at Cleveland, O., on February 19. The happy married life thus begun continued through all the years, in varying circumstances and in the several places to which his life work called him. For four years he labored in Cleveland, and in 1884 he came to Chicago, identifying himself with the Mechanical Rubber Co., later the United States Rubber Co.

With the exception of four years at Akron, O., and two years at Cincinnati, he lived in Chicago. He gave himself industriously and conscientiously to the development of the industry of rubber manufacturing and was personally responsible for a number of processes and patents which played a large part in the place his company held in the industrial world.

Seven children were born to the Korengel household, three of whom died in infancy. Those remaining are Albert, of Norwood, Ohio; Clara and Edna, of Chicago, and Alma, of Gary, Indiana. There remain to mourn his loss, in addition to his wife and children, three sisters, eight grandchildren, and two great-grandchildren.

Thermoid Inspector

CHARLES H. V. WOOLVERTON, 56, for many years an inspector for the Thermoid Company, Trenton, N. J., died at his home at Fallsington, Pa., on October 10. He had long been identified with the rubber industry. Mr. Woolverton is survived by his wife, two daughters, a sister, and two brothers. Interment was in Greenwood Cemetery, Trenton.

Authority on Rubber

A NERVOUS breakdown in August, 1930, resulting in continued ill health was responsible for the decease of Walter E. Parker, 58, at his home in Detroit, Mich., on October 9. He was considered a pioneer in citrus canning and an authority on rubber. In 1926 Thomas A. Edison, at his experimental home, Ft. Myers, Fla., asked Mr. Parker to confer with him and George Carnahan, president of the Intercontinental Rubber Co., New York, N. Y., about the possibility of growing rubber in Florida. In the early years of the century Mr. Parker was general manager of the Mexican Crude Rubber Co., a company formed by Detroiters to extract rubber from the guayule plant in Mexico.

He had other interests. He was active in the mining and smelting industries of Mexico and Missouri, and was also president and a director of the Florida-Gold Citrus Corp. During the World War he was a captain in the Ordnance division.

He leaves behind his widow, a daughter, and five sisters.

President of Hannon-Knight, Ltd.

BURNS due to, it is believed, an explosion of gasoline in his garage led to the death of Matthew S. Hannon, president of Hannon-Knight, Ltd., manufacturer of druggists' sundries and other rubber goods, Toronto, Ont., Canada, on September 8. In

Matthew S. Hannon

1928 Mr. Hannon was president and general manager of The Hannon Tire & Rubber Co., and prior to that time was a director of the K. & S. Rubber Co., Ltd. He formerly had been with the Faultless Rubber Co., Ashland, O.

In his thirty-five years' executive experience with leading rubber manufacturers of the United States and the Dominion he won quite a reputation as a chemist. Mr. Hannon originated the one-piece small-neck bottle and possessed many other patents, including the color-control process.

He was born in Andover, Mass., about 50 years ago. Surviving him are his widow, a son, a daughter, and a brother Lawrence, who is with the Tyer Rubber Co., Andover.

John R. Reilly

FUNERAL ceremonies were held October 21 for John R. Reilly, 700 Longwood Ave., Los Angeles, Calif., whose body had been found in a vacant lot in that city two days before. A bullet wound in the head, a pistol beside him, and a note to his wife that he would never return told a story of despondency. Mr. Reilly had at one time been well-to-do and was well known in the rubber trade. For many years he had been employed by the Goodyear Tire & Rubber Co., Akron, O., in establishing sales branches in Europe, Australia, and South America. Next he set up an inner tube factory in Los Angeles, operating as the J. R. Reilly Rubber Co. Quitting that, he took the Los Angeles franchise for the Michelin Tire Co., Milltown, N. J., building an elaborate service station as headquarters. When the tire company ceased business, he tried several other lines but without success.

E. Roy Fenwick

E. ROY FENWICK, 52 died recently in Montreal after having been ill for a year. He was at one time branch manager of the Dunlop Tire & Rubber Goods Co., Ltd., St. John, N. B., and was also for a short time manager of its Montreal branch.

Research Chemist

TWO weeks after a serious operation Dr. William A. Ducca, of Butler, N. J., died on September 26 in St. Peter's Hospital, New Brunswick, N. J. For the past five years he had been a research chemist with the American Hard Rubber Co., Butler.

The deceased was born in Germany 51 years ago and educated there. About a quarter-century ago he came to this country.

Funeral services were held at St. Paul's Church, Highland Park, on September 29. Surviving Dr. Ducca are his widow and three children.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Commodity	City and Country
*54,009	Druggists' sundries	Goteborg, Sweden
*54,013	Bath shoes	Port Said, Egypt
*54,022	Athletic and sport goods	Lisbon, Portugal
†54,032	Tile flooring	Montreal, Canada
†54,082	Tires	Lodz, Poland
*54,087	Boots and shoes	Frankfort, Germany
†54,197	Druggists' sundries	London, England
†54,202	Overshoes	Berlin, Germany
†54,219	Sponge rubber mats	Copenhagen, Denmark
†54,220	"V" type fan belts	Milan, Italy
†54,224	Canvas shoes	San Juan, P. R.
†54,250	Druggists' sundries	Pernambuco, Brazil

*Purchase. †Agency.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
1419	Manufacturer of dial thickness gage for measuring rubber sheets.
1420	Manufacturer of rubber backed rugs.
1421	Manufacturer of balloon squawkers.
1422	Manufacturer of individual inner tube vulcanizers.
1423	Manufacturer of inner tube transfers.
1424	Source of supply of rubber dough.
1425	Source of supply of Accra flake.
1426	Source of supply of Pontianac resin.
1427	Manufacturer of rubber paint.
1428	Manufacturer of rubber upholstery material.
1429	Manufacturer of interlocking rubber tile.
1430	Manufacturer of rubber aprons.
1431	Manufacturer of dipped goods including electrical, surgical, household, and industrial rubber gloves.
1432	Supplier of rubber foam.
1433	Manufacturer of heavy leaded rubber sheet material.
1434	Manufacturer of tire wrapping paper.
1435	Manufacturer of machine for making door mats out of old automobile tires.
1436	Manufacturer of machine for shredding wheat straw and rye straw.
1437	Manufacturer of steam splicers used for splicing pole cured inner tubes.
1438	Maker of Champion sponge rubber ball.

Rubber Industry in Europe

GREAT BRITAIN

Rubber in Airplanes

The extent to which rubber is used in airplanes is perhaps not usually fully realized; so a list of the various rubber articles in airplane construction would more or less surprise the average person.

In the planes used in the Schneider Trophy Race special features required special uses of rubber, as is interestingly described in an article in *India Rubber Journal*. A tensioning device, employing a small column of compression rubber housed within the wing or airplane body, was devised to overcome the danger from the slackening, during flight, of the anti-lift wires, one or two sets for bracing the wings. The entire circumference of the cockpit is cushioned with sponge rubber beading to prevent injury to the pilot when because of the terrific acceleration of the machine, the sudden opening of the throttle forces his head against the back of the cockpit.

Owing to restricted space petrol, hot oil, and water pipes pass through the body of the machine, close to the pilot; so to prevent burning, these pipes are protected at probable points of contact by several layers of asbestos covered with rubber hose. In the water cooling system also, extensive use of rubber is made. The engines have special rubber gaskets to prevent water penetrating to the power plant. Rubber hose connections are used for joining the waterways in the wing surfaces—devised to provide the necessary water radiating surface required because of the abnormal horse-power of the machine—and the pipe lines in the body. Rubber covered doors are used in the floats where the petrol is stored, to make filling plugs, doors, and inspection doors watertight. The pilots seat is suspended on rubber cord. A composition of rubber, moreover, is placed between the plates in the lap-riveted joints of the body to make them sound- and leak-proof. The feet on which the engine rests are insulated by fiber, synthetic resin, or vulcanite blocks. Finally, are the tires on the wheels of the machine and the pneumatic tires on the cradle trolleys used in transporting the craft from hangar to water.

Rubber Goods at Selfridge's

At the invitation of the Rubber Growers' Association more than 70 manufacturers of rubber goods, sent articles to Selfridge, in London, for display and sale in a special section during the week of October 5, 1931. Besides the sales display, pictorial and actual demonstrations were given of the process of manufacturing certain articles. It is hoped in this way to help popularize rubber goods, particularly as it may be expected that other large stores will follow the Selfridge example.

The exhibitors included the best known British rubber manufacturing firms. The British Goodrich company was also represented. The goods shown ranged from rubber buttons to flooring, from solution to furniture, and from elastic laces to imitation turf. The Dunlop Rubber Co., Ltd., demonstrated the dipping process, the Veedip company had a variety of rubber goods made from latex; Flooring Developments Syndicate sent cork rubber flooring; David Moseley & Sons, Ltd., showed camping equipment, yachting suits, motoring accessories, etc.

Institution of the Rubber Industry

On October 12 at the eighth annual meeting of the London and District Section of the Institution of the Rubber Industry a paper, "The Advantages and Disadvantages of Technical Training for Salesmen in the Rubber Industry," was read by A. E. Osborn. Before the meeting an informal dinner took place.

The Manchester and District Section also held its eighth annual meeting last month in conjunction with the Manchester Section of the Institute of Chemistry. R. Maitland read a paper on "A General Review of Plastic Materials."

The West of England Section met at Trowbridge on October 7 for its second annual meeting. After the business of the meeting had been concluded, a paper entitled "Concentration and Compounding of Latex for Industrial Use." was read by Dr. D. F. Twiss.

Vulcanized Latex Footwear

The manufacture of rubber footwear from vulcanized latex, as developed in England by Veedip, Ltd., is described by S. D. Sutton in *India Rubber Journal*. Vulcanized latex for Giltex footwear, as the Veedip line of beach shoes, galoshes, golf overshoes, and slip-on protectors for women's shoes is called, has been used by this concern for more than two years. The results have shown it to be particularly suitable for mass production; so increasing demands are looked for.

In making Giltex beach shoes the lasts are dipped into a vulcanized latex compound, and after drying in a hot air current, an insole of particularly durable rubber is attached. Then two more coats of vulcanized latex are given, followed by a dip into colored latex. Next the outsole of rubber is attached by a machine which gives the sole the correct shape. Afterwards, the shoe, while wet, is immersed in a suitable solvent. In the interval between dipping in the vulcanized latex and the solvent a thin skin of dry cured latex has formed with a layer of wet rubber between it and the dry undercoats of the shoe. Immersion into the solvent causes the outer skin to wrinkle, swell, and coagulate slowly the wet latex below. This action gives a roughened surface with non-slip qualities to the sole of the shoe. The roughening process may also be used to produce decorative effects on the surface of the shoe, or a crepe effect may be obtained on the surface by dipping into transparent vulcanized latex before roughening in the solvent.

If highly concentrated latex is used, the number of dips for a shoe of standard thickness can be reduced to two; but then a much longer period for drying is required. The use of a less concentrated mix also makes it possible to eliminate the air bubbles which persist in high concentrations.

With the described process no after vulcanization is required, and as vulcanization is controlled before the shoes are made, correct cure, maximum strength, and durability are insured. Finally, the range of colors that can be used in the process is more extensive than in hot curing.

Company News

The Dunlop Rubber Co., Ltd., announced it would not declare an interim dividend on the common stock, as owing to the continued depression it was considered prudent to await the outcome of the year's results. Similarly, the company stated that it would omit dividends on its A, B, and C preferred shares until the final accounts for 1931 have been balanced. The financial position is stated to be very strong, and liquid resources have increased materially.

Symington & Sinclair, 17 Mincing Lane, London E. C. 3, recently announced that owing to the ill health of Edgcumbe Sinclair, who was compelled to retire, the partnership has been dissolved as of June 30, 1931. Harry Symington and Ian Wilson, the remaining partners, will continue the business as Symington & Wilson.

Shipping, Engineering, and Machinery Exhibition, held at Olympia, London, from September 10 to 26, displayed insulated wires and cables, asbestos and rubber packing, and a variety of rubber goods used in engineering and shipping. The Rubber Growers' Association, as was to be expected, put its best efforts to the fore and showed a ship's lounge and a Pullman coach, in which the various applications of rubber were demonstrated. The association also had a railway exhibit showing the variety of rubber uses in rail construction, a mining section, and a chemical section. In addition were a scientific exhibit organized by the Research Association of British Rubber Manufacturers, a demonstration of the production of rubber articles direct from latex, and a Fordson tractor, weighing 2½ tons, fitted with a rubber jointed track by Roadless Traction, Ltd., Hounslow.

GERMANY

German Rubber Manufacturers

Gummi-Zeitung analyzes the 1930 reports of 23 German rubber manufacturers. From the data supplied it appears that the capitalization of these concerns approximated 92,000,000 marks in 1930 against about 82,000,000 marks in 1928. Firms increasing their capital were: Pepege Deutsche Gummi-Werke A.G., now the Standard Marienburger Gummiwerke A.G., manufacturer of footwear, which doubled its capital in 1930 to extend its works; German Michelin, which raised its capital by 4,000,000 marks to meet costs of new buildings and equipment to manufacture tires in Germany; Continental, which increased by 6,000,000 marks a capital of 34,100,000 marks for its fusion plans; and the New York Hamburger Gummiwaren Co., which raised its capital from 5,000,000 to 6,500,000 marks when it absorbed the Heinrich Traun & Söhne concern. One firm, Alfred Calmon A.G., reduced its capital upon reorganization. It is pointed out that, while so far no other important reorganizations have occurred, if 1930 conditions continue, there seems to be a real danger that this policy will be necessary, particularly as some firms are rather less than sound.

The reserves of the 23 concerns showed little change and came to about 13,800,000 marks in 1928 and 13,200,000 in 1930. There appears, therefore, not to have been any need to touch these reserves to even up balances. It, however, is pointed out that signs are not wanting to indicate that quiet reserves have been tapped to make a better showing. Thus, only a slight reduction occurred in the valuation of immovable property, some firms have included their newly acquired machinery among the assets instead of writing these off as high as possible as they were accustomed to do in previous years. Then, although the value of the stocks has been listed at a total of about 34,500,000 instead of about 44,000,000 marks, the amount on the whole is still considered too high. Finally a comparison of the sums written off during the last few years shows that in 1930 in many cases these were considerably reduced. In fact, it is stated that only by making these reductions were the firms concerned able to show profits.

Creditors are booked with a total of 72,500,000 against 70,000,000 marks in 1928, and debtors at 86,000,000 instead of about 77,000,000 marks. As was to be expected, sales in many instances declined chiefly as to values: the Phoenix company reported a reduction of 20 per cent in the value of its sales; Continental, a reduction of 16 per cent; and the Kölnische Gummi-Faden-Fabrik, 20 per cent by quantity and 38 per cent as to value. The Vereinigte Gothania Werke A.G., reported both reduced local sales and exports; the Veritas Gummi-Werke A.G., was able to offset the decrease in sales of rubber technical goods by taking up the mass production of other lines. The Standard Marienburger Gummiwerke A.G., on the other hand, increased its output during the year, and the orders secured for the summer season of 1931 were 50 per cent higher than for the preceding year; the factory had for a time to work with two and three shifts. C. Muller Gummiwaren-Fabrik A.G., showed a 10 per cent increase in the value of sales; while the Elbe concern for 1930 reported the largest sales in its history, both in quantity and value.

But even in the most favorable cases the profits declined. Net profits were booked by 12 out of the 23 firms in 1930 against 17 in 1928, the amounts having been roughly 4,850,000 against 7,250,000 marks. In 1930 six firms had losses totaling 1,560,000 marks against three in 1928 with a total of 230,000 marks. Only seven firms declared dividends in 1930, the total amount being 4,420,000 marks, as compared with 10 firms in 1928, with a total of 3,590,000 marks. Only one firm, the Vulkan company, was able to maintain its dividend at the same percentage during the last few years; all the other concerns had to reduce the percentage more or less.

On the whole the liquidity of the firms discussed is considered satisfactory, although some retrogression in this respect is noted in the case of various firms.

Company Notes

Germany's exports of rubber goods to France during the first half of 1931 were 5,438 quintals, against 6,839 in 1930 and 3,665 in 1929. At the same time French exports to Germany seriously declined from 4,280 quintals in 1929 to 2,447 quintals in 1930 and 1,611 quintals in 1931.

The latest novelty in women's raincoats in Germany is of rubberized ivory-colored batiste decorated with pipings in dark colors on the standing collar, large pointed revers, belt, and cuffs. The buttons are of galalith of the same color as the piping. Large slanting patch pockets add the final touch to a striking garment.

The Deutsche Kautschuk Gesellschaft has decided to recognize those of its members considered to have excelled in their field of work by awarding them a plaque inscribed: "For Exceptional Services." The first to receive these plaques were: Dr. M. Clouth, Prof. C. Duisberg, Director A. Gottschalk, Prof. E. A. Hauser, Prof. L. Hock, Prof. F. Hofmann, Prof. E. Kindscher, Dr. F. Kirchhof, Director W. Lindemann, and Gen. Director W. Tischbein.

Microporous Rubber

A patent has been taken out by the Metallgesellschaft A.G., Frankfurt a. Main, for a process joining microporous rubber parts together or attaching them to other bodies, without the use of adhesives which would create places in a finished article that showed inferior chemical resistance. The invention is based on the fact that when microporous rubber is heated, it melts to a tenacious mass that can serve as adhesive and give unusually tight joints when cool. When two porous rubber bodies are to be joined, the two surfaces that are to be connected are heated by passing a hot iron over them several times, until the rubber on the surface has melted to a smooth, sticky layer. The melted surfaces are then brought together, pressed, and allowed to cool. A peculiarity, that has its use when the joints are not to be made immediately or when the parts have to be transported elsewhere before being joined, is that the melted surfaces retain their adhesive property indefinitely. If, therefore, for any reason at all it is not feasible to combine the treated surfaces immediately, the joining can be done at any convenient time, when it is only necessary to heat the melted part again, press the pieces together, and then to cool under pressure. In this way it is possible to join not only two sections of microporous rubber, but also to apply microporous rubber to metal, wood, glass, concrete, ordinary rubber, cork, etc. The microporous rubber thus treated can also be used between two layers of any other material in order to join them together.

Propaganda for German Goods

To promote local consumption of German-made goods widespread propaganda is planned under the motto "German Work—German Goods." In Frankfurt a. Main an association has been formed known as Deutsche Woche (German Week), which intends to make propaganda for German goods in the Wiesbaden district, starting in the Fall. The Frankfurter Hausfrauen Verein (Frankfurt Association of Housewives) held an exposition from October 3-11, which was known as "Im Reiche der Hausfrau," the Housewife's Domain, where nothing but German products were used. The aim of these two organizations is to make the public realize the importation of many articles is not necessary since the same articles can be obtained of German make, generally at lower prices. These items, of course, include a number of rubber products. The scope of the Deutsche Woche covers explanatory work, advertising, film demonstrations, descriptions in daily papers, etc. It was suggested that German rubber manufacturers should, collectively, participate in the work of the Deutsche Woche and exhibit at the exposition initiated by the Housewives' Association.

SOVIET RUSSIA

Soviet tires have been offered for sale at auctions in Dantzig. It seems, furthermore, that the influx of Soviet rubber footwear into Poland, sold at dumping prices, is causing such damage to local manufacturers that the rubber cartel has approached the Polish Government to obtain measures to prevent this condition. The rapid increase in shipments to Poland from Soviet Russia in the last few years may be judged from the fact that whereas in 1927 the exports of Soviet rubber footwear amounted to 61 tons, in 1930 they had increased to 292 tons.

Rubber Industry in Far East

NETHERLANDS EAST INDIES

Enticing Restriction Bait

It has more than once been remarked that as a rule the local agricultural papers devote comparatively little space to restriction matters and that the incessant complaints met with in the Malayan papers is almost entirely absent. An editorial discussion of the restriction question in the *Algemeen Landbouwweekblad*, therefore, almost amounts to news, and when entitled "Enticing Restriction Bait," promises to be particularly refreshing. This caption alone tells the whole story, that the writer will have nothing to do with restriction. He bluntly states that the present slump in the rubber industry will have to be endured until it corrects itself for no quack remedies such as restriction measures that transgress all economic laws are going to improve matters.

In the meantime, many estates will go bankrupt, and numbers of estate managers and assistants will be without means of support. But these tragedies must be accepted for the laws of nature cannot be escaped.

There is but one means of saving the European rubber industry, or at least a large part of it, and that is reducing costs in conjunction with the best aid from science and more extensive uses of rubber. For the danger facing the European is not over production or under consumption but the enormous potential native outputs, particularly in the Dutch East Indies.

The threat of a rubber war between British and Dutch—though by no means empty since the British Malayan planter has made up whatever advantage the Dutch planter had over him in scientific methods and has effected wonderful economies in working his estate—is as yet remote compared with the immediate danger represented by the native grower. For the native is waiting only for a rise in prices brought about by restriction to give him an impregnable position in the world's rubber industry. With that the doom of the European rubber estate would be pronounced.

The final opinion is that there is no use awaiting action by the new Governor-General in enforcing restriction, for no such step will be taken, and a decision to to this effect will be made known in unmistakeable language.

Uneconomical Tapping Systems

At the present time, when reducing costs to a minimum is the aim of every planter, suggestions for saving receive eager attention. Dr. Tengwall, of the Experiment Station for Rubber, has just issued a circular to estate agents and directors, describing a method of cutting tapping costs.

Investigation shows that in 1929, 41.6 per cent of the Java and Sumatra estates were tapping over ⅓ the circumference every other day or every other period, and in May, 1931, the Rubber Experiment Station stated that savings could be effected if the cut was lengthened to ½ the circumference. Now, however, it is stated that experience has shown that if 2 cuts are made daily over half the circumference, the yield is often quadrupled the first month, and if carried out on alternate days, the yield is doubled and often trebled. The rest periods would, of course, have to be increased.

If with the system mentioned the yield is quadrupled and tapping is done daily for a month with a resting period of three months between each tapping period, a saving of 50 per cent in tapping costs would result. Because of the extra work involved in this system, however, the tasks would have to be reduced by 25 per cent when there would be a saving in tapping costs of ⅓ besides a saving in costs of supervision.

The manager of the Badek Estate, Mr. Kuneman, takes issue with the above statements and shows that the economy of a tapping system is limited by the workers' physical capacity. Thus, if the normal task of a tapper was 295 trees tapped over ½ with one cut, he tapped $295 \div 3 = 98$ lengths, whereas with 2 cuts over ½ he had $295 \times 2 \div 2 = 295$ lengths that is 3 times as much. With such long cuts, too, careful tapping is much more difficult; moreover, with the increased amount of work to be done, the tapper will not finish his task as early as is necessary for the trees to get the full advantage of early tapping. Finally, the extra amount of latex and cups to be transported will be an added burden to the tappers, and impossible for the female tappers to bear, causing dissatisfaction among the male tappers so that the tasks will have to be reduced and assistants supplied. This action would make negative the savings on tapping costs counted on.

Dr. Tengwall replies to this objection that planters should be prepared to pay something for increased yields and that the extra transportation work involved, when the output is greatly increased, is a new problem that will have to be met as larger crops from budded trees have to be handled. Granting that the tasks will have to be reduced—he said as much in his first article—Dr. Tengwall still thinks his proposed method is cheaper. Thus he says, taking 300 trees tapped with one cut, as a normal task for a tapper receiving 35 cents a day, when the output per tree per tapping is 20 gr. of rubber the costs would work out at $35 \div 20 \times 300 = 5.8$ cents per kg. of rubber, while the amount of latex brought in would be 16.7 kg. for all the trees. If 2 cuts were made on 225 trees, and the yield per tree per tapping was 40 gr. while the tapping costs were 35 cents plus 15 cents for a helper, the costs per kg. of rubber would be 5.6 cents and the total daily output of latex 25 kg.

In the above calculation, the advantage appears to be with the double cut system, but if heavier tapping requires longer rest periods than the single cut system, then in the long run the advantage must disappear or become negligible and it is not worth while adopting the heavier system with the risk it involves of trees running dry, to say nothing of the ill-feeling caused by the more strenuous work required from the tapper.

When Dr. Tengwall speaks of the high producers of the future, he appears to overlook that a greatly increased output will be obtainable from *one* cut, and that if 2 cuts were thought expedient the excess in crop would amply compensate for any expenditure required for transportation.

In any case one is led to observe, that in matters of economy as in everything, it is possible to go too far.

Research Work

A series of tests were instituted by D. J. N. van der Hoop to determine the correlation between the yield of buddings and seedlings and their girths. The coefficients of correlation found for seedlings were not high and are on the same order as those found by other investigators, that is between 0.4 and 0.6. In the case of clones from the same mother tree much higher values were obtained, showing that the correlation between the output and the girth of buddings from a specific mother tree is much greater than in seedlings of the same tree. This finding agrees with that of Vischer and Tas.

Manuring tests undertaken in the district of the Malang Experiment Station and reported on by C. C. Ament led to the conclusion that, although in several cases manuring gave improved health and yield of trees, nevertheless the differences were such that manuring can hardly be called profitable from an economical point of view.

Similar tests with nitrogenous manures, chiefly sulphate of ammonia, were carried out by L. R. van Dillen and W. Snoep in the district of the Besoeki Experiment Station. The conclusion reached was that manuring did not pay. In only a few cases could a slight improvement in the appearance of the trees be noted, and in only 2 instances was there a small increase in yield. In all the other cases manuring appeared to have no favorable influence at all. In one instance a slightly unfavorable effect was noted, and in three cases it was observed that the manuring delayed the wintering of the trees up to three weeks.

MALAYA

Silent Roadways

In a recent issue of this journal[1] mention was made of a method of surfacing roads with rubber, invented by R. W. Kendall, of Pinji Rubber Estate, and David Graham. Since then details of their process, known as "silent roadways," have been published in the *Malayan Tin and Rubber Journal.*

The new road-surfacing material appears to consist of sheets of a vulcanized composition having a pure rubber content of 45 per cent, although the inventors believe that an equally efficient and serviceable composition could be obtained with a smaller percentage of rubber. The dimensions of the sheets are 14 by 3 feet, one inch thick. This material is placed on top of a fairly hard grade boiling hot asphalt that has been poured over the area to be treated, which must have a rather smooth surface. The space between the sheets is caulked with a preparation of hot asphalt and coconut fiber. The roadway is ready for traffic as soon as the joints have caught; this joining they do within a few minutes, and the whole presents a neat, compact, even surface.

A strip of roadway opposite the Pinji Estate factory, a few miles from Ipoh, has been covered with the new material, and it is reported that not a single vehicle that has passed, including motor vehicles, bullock carts, and even a heavy traction engine transporting a cumbersome portable boiler from a mine, could make the least impression on the surface of the road or disturb it in any way.

The advantages claimed for "silent roadways" are: low costs, ease of laying, durability, evenness of surface, and prevention of vibration. According to calculations by Graham and Kendall the costs work out at about $2.75 per sq. yd. at present price levels to about $6.20 per sq. yd. when rubber is about 14 cents a pound. (All U. S. currency.)

Agricultural Conference

Probably as a result of the discovery of the important part which the natives play in the rubber industry in the East, much more attention now is directed to the different phases of the native industry. A report of the Second Interdepartmental Agricultural Conference held at Kuala Lumpur in latter part of 1930 shows that of the 6 papers dealing with matters pertaining to rubber, 5 were devoted to problems of the native small-holder.

In a paper on "The Application of Budgrafting to Kampong Conditions," Mr. Mann favored distributing budded material to native small-holders from a central station rather than from departmental demonstration stations. The opinion of the meeting, however, was that establishing reproduction nurseries and distributing material could advantageously be undertaken at stations under close supervision of the agricultural field officers. The price of the material would be figured to cover only costs of production.

A paper on "Cooperative Rubber Societies among the Malay Small-Holders" led to a discussion of the best means of organizing the Malays to cooperate in producing and selling their rubber.

R. O. Bishop, speaking on the "Preparation of Rubber from the Point of View of Small-Holders," revealed that native rubber sheets frequently contained sand, a sign of inferiority. He pointed out that if the natives were willing to be sufficiently careful, no great difficulty stood in the way of their producing a good quality of sheet rubber. Under present market conditions the possibility exists that eventually inferior rubber might become unsalable. It is, therefore, specially important that natives improve their methods of preparation; so he suggested establishing a grade to which rubber must conform before it could be exported; thus a form of restriction would be imposed on the smallholder.

Two papers treated of measures to control diseases: "Oidium and Moldy Rot, with Special Reference to Small Holdings" by Mr. Beeley, and "Difficulties in the Control of Pests and Diseases in the Field," by Mr. Norris, who believed that measures of controlling pests and diseases on small holdings could more easily be effected by persuasion than by legal compulsion. Dr. Flint dealt with the "Chemical Manuring of Rubber." While manuring of rubber has been shown to be beneficial under certain circumstances in improving the health and the yields of trees, it was doubtful whether manuring on the majority of rubber estates was profitable with present low rubber prices.

Improving Hevea Planting Material

Reference must again be had to the Annual Report for 1930 of the Rubber Research Institute of Malaya, particularly in regard to the work done in improving Hevea planting material.

In October, 1929, began a selection of promising parent trees. Although for economic reasons some estates had to discontinue recording yields for this purpose, nevertheless it was possible to collect data from various estates throughout the country; so the trees finally selected may be considered fairly representative and certainly include some of the highest yielding trees known. With a few exceptions the selected mother trees yielded well over 200 gr. per tapping, the two highest producers giving 407 and 444 gr. per tapping, respectively, and an annual yield of 143 and 156 pounds respectively. Even the least productive of these trees gave 133 gr. per tapping and 46.8 pounds per annum. Budwood was collected from the selected trees in December, and buddings are being established in a multiplication nursery.

Interesting and successful tests were conducted in multiplication by "disbudding," by which the fullest use of valuable plants is obtained. The method consists in carefully removing dormant buds from the more mature portions of a budded plant without actually cutting the whole shoot. This type of multiplication has been used in establishing several series of buddings from seedlings resulting from controlled crossing experiments.

The work carried out in 1929 in twinning, raising two seedlings from one seed, opened the way for another method of propagation. In 1930 about 3,000 twins were successfully prepared and planted. Further experiments demonstrated the possibility of producing *four* plants from a single seed.

An examination of figures for yield, girth, and latex vessel rows obtained in 1929 showed very high degrees of correlation between yield and girth, and between yield and the number of latex vessel rows. These results are considered of practical value in thinning operations since for all practical purposes the relationship between yield and girth within a clone is so close that thinning can be based on girth measurements, eliminating the need of expensive test tapping and recording.

Mention may further be made of tests on methods of bark treatment to increase the yield of latex and bark renewal. Results on some estates appear to indicate that certain protective coverings help improve bark renewal and also give a softer bark more suitable to tapping. However before these treatments can be recommended, further experiments are needed.

Central Rubber Factories

At a meeting of the Rotary Club at Kuala Lumpur, John Hands, manager of the Kajang Central Factory, spoke on central rubber factories. The Kajang factory, the only one of its kind in Malaya, was started in 1911, serves 6 rubber companies, and at present is capable of turning out 4¼ million pounds of crepe annually.

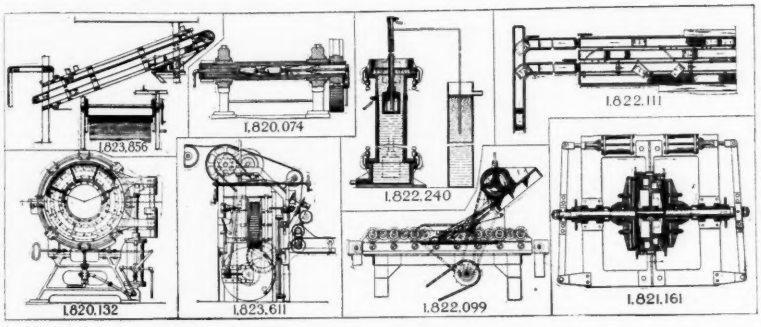
The importance of central factories, according to Mr. Hands, is that on their development depends the prosperity of the rubber growing industry and, consequently, of Malaya. Numbers of estates at present are so close together that the obvious need seems to be that the properties combine and centralize their factories. Under present conditions millions are uselessly paid to directors, and much expensive duplication of work exists.

Since the rubber tree is what it is natives cannot be prevented from tapping their trees, nor can they kill them, the only hope for the industry in Malaya is to produce a better rubber at a cheaper price. This work can be done only in large central factories.

Mr. Hands emphasized that the raw material obtained from the trees is latex and not rubber, and that the only way to develop a raw material into a really great industry is by exploiting by-products. The by-products of latex can be discovered only when the properties of latex are fully understood, and it is only in central factories, where large quantities of latex are handled, that these properties can be studied; and not until something more valuable than rubber is extracted from latex, would rubber roadways, for instance, become a commercial proposition.

[1] "Rubber Paving," India Rubber World, July, 1931, p. 89.

Patents, Trade Marks, Designs



Machinery

United States

1,820,074.* **Cool Mill Rolls.** This roll has a tubular cavity extending through its neck at one end beyond which it is enlarged and carried full size to the opposite end of the roll. Water for cooling is piped in through the first end, being sprayed and diverted by special fittings against the inside of the roll. Drainage is through the opposite end, which discharges into a receptacle from which the water is piped away. K. B. Kilborn, Fairlawn, assignor to Seiberling Rubber Co., Barberton, O.

1,820,132.* **Watchcase Tube Vulcanizer.** This invention provides an improvement upon the stationary and movable sections of this type of tube vulcanizer. By its construction not only is the tube seated easily within the cavity and with less liability for pinching, but the heat of the steam chamber on the interior of the mold is brought around under the side of the tube. A. J. Fleiter, assignor to Akron Standard Mold Co., both of Akron, O.

1,821,161.* **Bead Forming Machine.** Means are provided with which tire beads of different diameters may be rapidly and efficiently constructed. Also the same set of pressure rolls is used for shaping beads of different diameters. W. E. Humphrey, Jeannette, Pa., assignor to Mason Tire & Rubber Corp., Kent, O.

1,822,099.* **Heel Washer Placer.** In an automatic mechanism for feeding heel washers from a hopper to a mold having upstanding washer supporting pins, escapement mechanism is included for depositing the washers upon the pins. The device is universal in its application to molds of all sizes and to molds having various arrangements and sizes of washer pins. W. D. Kmentt, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,822,111.* **Conveyer System.** Means are provided for supplying to operatives, shoe lasts and the various parts of rubber and rubberized fabrics that must be assembled on the lasts to form shoes. The materials are moved in cars and automatically switched from station to station. C. M. Richardson, Akron, and A. J. Howe, Cuyahoga Falls, both in O., assignors to B. F. Goodrich Co., New York, N. Y.

1,822,240.* **Pipe Lining Apparatus.** Cylindrical structures, excepting the very smallest, are lined with rubber by electrodeposition. In addition the invention permits lining even very large or extremely long pipes with a minimum depositing current and maintains the concentration of the latex substantially constant during the deposition. J. W. Schade, assignor to American Anode, Inc., both of Akron, O.

1,823,611.* **Tread Cutting Machine.** An improved tread measuring and cutting machine is arranged to cut measured lengths of stock from continuous lengths of material. The cutters are intermittently rotated while the cutting mechanism is being transversely actuated across the stock for continuously shearing predetermined lengths from it. A. R. Krause, assignor to Gillette Rubber Co., both of Eau Claire, Wis.

1,823,856.* **Fabric Manipulating Machine.** The object is to provide an apparatus for inspecting continuously a moving strip of fabric which will permit the temporary interruption of a predetermined area of the fabric without interruption of the remaining portions. R. D. Evans, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,820,073. **Mill-Roll Cooler.** K. B. Kilborn, Fairlawn, assignor to Seiberling Rubber Co., Barberton, both in O.

1,820,478. **Tire Repair Vulcanizer.** C. E. Norris, London, Ont., Canada, assignor to Summit Mold & Machine Co., Akron, O.

1,820,892. **Tire Mold Opener.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,821,049. **Recovering Minerals from Old Rubber.** J. W. Ames, Jersey City, N. J.

1,821,470. **Bead Former.** W. E. Humphrey, Jeannette, Pa., assignor to Mason Tire & Rubber Corp., Kent, O.

1,822,014. **Cementing Machine.** J. W. Cosgrove, deceased, by C. E. Cosgrove, administratrix, both of Medford, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

1,822,022. **Flexible Vulcanizing Spotter.** A. W. Gay, Reno, Nev.

1,822,209. **Strip Material Cutter.** J. R. Gammeter, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,822,443. **Bead Forming Device.** Y. H. Kurkjian, Hawthorne, N. J., assignor to Carl J. Schmid, Inc., New York, N. Y.

1,822,509. **Pile Fabric Machine.** P. S. Smith, Madison, assignor, by mesne assignments, to Lea Fabrics, Inc., Newark, both in N. J.

1,822,510. **Pile Fabric Machine.** P. S. Smith, Summit, assignor to Lea Fabrics, Inc., Newark, both in N. J.

1,822,590. **Repair Vulcanizer.** L. O. Grange, assignor to W. J. Jarratt, both of Chicago, Ill.

1,823,501. **Rubber Cutter.** L. H. Messinger, Jr., assignor to Black Rock Mfg. Co., both of Bridgeport, Conn.

1,823,545. **Tire Casing Spreader.** B. E. Johnson, assignor of 12½ per cent to D. L. Cleveland, 12½ per cent to L. L. Hueston, and 12½ per cent to R. L. Swarzman, all of Des Moines, Iowa.

1,823,566. **Cushion Tire Former.** H. F. Maranville, assignor to General Tire & Rubber Co., both of Akron, O.

1,823,956. **Sectional Mandrel.** R. Schroeder, Berlin-Weissensee, Germany.

1,824,568. **Wire Treating Device.** R. C. Pierce, assignor to National-Standard Co., both of Niles, Mich.

1,824,593. **Wind-up Mechanism.** M. Castricum and P. L. Butterfield, both of Springfield, assignors to Fisk Rubber Co., Chicopee Falls, all in Mass.

Dominion of Canada

314,953. **Repair Vulcanizer.** F. C. Kenyon, Montreal, P. Q.

315,048. **Tire Trimmer.** Goodyear Tire & Rubber Co., assignee of J. I. Haase, both of Akron, O., U. S. A.

315,050. **Band Builder.** Goodyear Tire & Rubber Co., assignee of W. E. MacMonagle, both of Akron, O., U. S. A.

315,075. **Mold Forming Apparatus.** National Rubber Machinery Co., assignee of O. J. Kuhlke, both of Akron, O., U. S. A.

315,242. **Mold Serving Device.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of R. W. Brown, Akron, O., U. S. A.

315,243. **Mill Mixer.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of H. D. Stevens, Akron, O., U. S. A.

315,462. **Tire Builder.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of O. L. Flener, Akron, O., U. S. A.

United Kingdom

349,997. **Hollow Article Mold.** C. J. Schmid, Inc., New York, N. Y., U. S. A.

* Pictured in group illustration.

350,227. **Molded Article Core.** Soc. Italiana Pirelli, Milan, Italy.

350,648. **Vulcanizer.** Pioneer Ventilating & Drying Co., Ltd., J. H. Wild, and J. Lloyd, all of Manchester.

351,014. **Tire Mold.** Firestone Tire & Rubber Co., Ltd., Middlesex, assignee of G. B. Nichols, Akron, O., U. S. A.

Germany

533,399. **Belting Connector.** Continental Gummiwerke A. G., Hannover.

534,146. **Shoe Mold.** M. Wissaert, Brussels, Belgium. Represented by G. Breitung, Berlin S.W. 11.

534,669. **Kneading Machine Trough.** F. Kempter, Stuttgart.

534,670. **Speed Regulator.** Dunlop Rubber Co., Ltd., London, England. Represented by R. and M. M. Wirth, C. Weihe, and H. Weil, all of Frankfurt a. Main, and T. R. Koehnhorn, Berlin S.W. 11.

534,850. **Mold for Latex Articles.** Morgan & Wright, Detroit, Mich., U. S. A. Represented by W. Karsten and C. Wiegand, Berlin S.W. 61.

France

709,515. **Tire Making Apparatus.** Dunlop Rubber Co., Ltd.

709,761. **Tire Molds.** Dunlop Rubber Co., Ltd.

711,021. **Apparatus for Rubber Footwear.** C. H. R. Collins.

Process

United States

1,820,124. **Ball.** I. and L. Dorogi, both of Budapest, assignors to Dr. Dorogi és Társa Gummigyar R. T., Budapest-Albertfalva, all in Hungary.

1,821,679. **Molding Tires.** I. Trautman, Freeport, assignor to Air Sealed Tire Corp., New York, both in N. Y.

1,821,885. **Coating Constructional Material.** A. C. Fischer, Chicago, Ill., assignor to Philip Carey Mfg. Co., a corporation of O.

1,822,226. **Electrodeposition of Rubber.** F. H. Lane, Erdington, England, assignor to American Anode, Inc., Akron, O.

Dominion of Canada

314,730. **Electrical Conductor.** H. Horsfall, Forest Hill, Ont.

314,934. **Footwear.** H. C. L. Dunker, Helsingborg, Sweden.

315,463. **Tire.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of J. I. Martin, Akron, O., U. S. A.

United Kingdom

351,803. **Tire.** A. J. Musselman, Cuyahoga Falls, O., U. S. A.

France

709,246. **Manufacturing Improvements.** New York Belting & Packing Co.

710,086. **Making Footwear.** A. Candi and J. Collin du Bocage.

710,320. **Increasing Output of Presses.** E. A. R. Girard.

710,782. **Hollow Articles.** J. Goldstein.

711,167. **Embossing Molded Goods.** Societe Industrielle d'Aleth.

Chemical

United States

1,820,085. **Heat Transferring Liquid.** T. A. Moormann, Milwaukee, Wis., assignor to Shaler Co., Wilmington, Del.

1,820,444. **Compounding Ingredient.** A. B. Cowdery, Needham, Mass., assignor to Barrett Co., a corporation of N. J.

1,821,703. **Gum-Resin Compound.** R. S. Goodenow, Chicago, Ill., assignor of ½ to G. L. Curtis, Clinton, Iowa.

1,822,072. **Electrical Insulation.** W. B. Wiegand, Sound Beach, Conn.

1,822,108. **Stabilization Composition.** P. I. Murrill, Plainfield, N. J., assignor to R. T. Vanderbilt Co., Inc., New York, N. Y.

1,822,249. **Aqueous Organic Dispersions.** A. Szegvari, assignor to American Anode, Inc., both of Akron, O.

1,822,253. **Surface Sealing Compound.** F. S. Vivas, assignor to International Fireproof Products Corp., both of New York, N. Y.

1,822,548. **Accelerator.** W. P. TER Horst, Packanack Lake, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,822,561. **Antiscorching Compound.** E. R. Bridgwater, assignor to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

1,822,934. **Stabilized Composition.** P. I. Murrill, Plainfield, N. J., assignor to R. T. Vanderbilt Co., Inc., New York, N. Y.

1,823,119. **Preserving Latex.** A. A. Nikitin, Passaic, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,823,260. **Chlorinated Caoutchouc.** M. Deseniss, assignor to A. Feurich, both of Hamburg, Germany.

1,823,335. **Sponge Rubber.** P. H. Richert, Berkeley, Calif.

1,823,531. **Rubber Antiager.** A. M. Clifford, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,823,855. **Dusting Composition.** P. A. Davis, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,823,921. **Coloring Rubber.** H. Tochtermann, Mannheim, assignor to I. G. Farbenindustrie A. G., Frankfort a. Main, both in Germany.

1,824,220. **Battery Box Composition.** A. B. Mackey, Cleveland Heights, and E. A. Mackey, assignors to Goliath Rubber Co., both of Cleveland, all in O.

1,824,609. **Accelerator.** W. Lommel and H. Friedrich, both of Wiesdorf a. Rhine, and T. Goost, Leverkusen a. Rhine, assignors to I. G. Farbenindustrie A. G., Frankfort a. Main, all in Germany.

Dominion of Canada

314,836. **Vulcanized Artificial Rubber.** I. G. Farbenindustrie A. G., Frankfort a. Main, assignee of E. Tschunkur and W. Bock, co-inventors, both of Köln-Mülheim, all in Germany.

314,899. **Gutta Percha Insulation.** Western Electric Co., Inc., New York, N. Y., assignee of A. R. Kemp, Westwood, and J. H. Ingmanson, Bloomfield, co-inventors, both in N. J., all in the U. S. A.

315,004. **Rubber Cement.** Bakelite Corp., New York, N. Y., assignee of R. P. Courtney, Maplewood, N. J., both in the U. S. A.

315,009. **Impregnated Fabric.** Bakelite Corp., New York, assignee of G. Baekeland, Scarsdale, both in N. Y., U. S. A.

315,049. **Latex Compound.** Goodyear Tire & Rubber Co., assignee of B. W. Rowland, both of Akron, O., U. S. A.

315,052. **Latex Stabilizer.** Goodyear Tire & Rubber Co., assignee of H. A. Endres, both of Akron, O., U. S. A.

315,053. **Age Resister.** Goodyear Tire & Rubber Co., assignee of W. D. Wolfe, both of Akron, O., U. S. A.

315,054. **Antioxidant.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

315,213. **Latex Treatment.** Brown Co., assignee of F. W. Vogel and P. Brown, all of Berlin, N. H., and R. B. Hill, Peabody, Mass., co-inventors, all in the U. S. A.

315,236. **Dispersion Product.** Dunlop Rubber Co., Ltd., London, N. W. 1, assignee of D. F. Twiss, E. A. Murphy, and W. G. Thorpe, co-inventors, all of Erdington, all in England.

315,332. **Dispersions Product.** Dunlop Rubber Co., Ltd., London, N. W. 1, England, and Anode Rubber Co., Ltd., St. Peter's Port, Guernsey, Channel Islands, assignees of E. A. Murphy, R. G. James, and D. F. Twiss, co-inventors, all of Birmingham, England.

315,333. **Rubber Thread.** Dunlop Rubber Co., Ltd., London, N. W. 1, England, and Anode Rubber Co., Ltd., St. Peter's Port, Guernsey, Channel Islands, assignees of W. G. Gorham and E. A. Murphy, co-inventors, both of Birmingham, England.

United Kingdom

350,269. **Devulcanizing Rubber.** L. Mellersh-Jackson, London. (American Glue Co., Boston, Mass., U. S. A.)

350,456. **Rubber Composition.** N. M. Mnookin, Kansas City, Mo., U. S. A.

350,472. **Vulcanizing.** J. C. Patrick, Kansas City, Mo., U. S. A.

350,549. **Vulcanizing.** J. C. Patrick and N. M. Mnookin, both of Kansas City, Mo., U. S. A.

350,563. **Rubber Preservative.** A. Carpmael, London. (I. G. Farbenindustrie A. G., Frankfort a. Main, Germany.)

350,833. **Rubber Compositions.** Imperial Chemical Industries, Ltd., London. (E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.)

351,012. **Latex Treatment.** Pirelli, Ltd., London. (Soc. Italiana Pirelli, Milan, Italy.)

351,248. **Fireproofing Textiles.** W. Pickard and J. West, both of Manchester.

351,356. **Age Resister.** Deutsche Hydrierwerke A. G., Anhalt, Germany.

351,442. **Chewing Gum.** Apotekarnas Kemiska Laboratorium Aktiebolag, Stockholm, Sweden.

351,581. **Proofing Composition.** Imperial Chemical Industries, Ltd., London, E. A. Bevan and W. J. S. Naunton, both of Manchester.

351,645. **Age Resister.** A. M. Clifford, Akron, O., U. S. A.

351,832. **Accelerator.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

351,844. **Antioxidant.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

351,945. **Synthetic Resins.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort a. Main, Germany.)

352,133 and 352,165. **Accelerator.** Imperial Chemical Industries, Ltd., London, and H. M. Bunbury, W. J. S. Naunton, and W. A. Sexton, all of Manchester.

352,652. **Oil Antioxidant.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

Germany

533,068. **Condensing Latex.** Veedip, Ltd., Brentford, England. Represented by B. Kugelmann, Berlin S.W.

533,288. **Cold Curing Rubber.** A. Eichengrun, Berlin-Charlottenburg.

533,373. **Thickening Latex.** K. D. P., Ltd., London, England. Represented by Cochlovius, Frankfurt a. Main.

533,633. **Refined Clay.** W. Feldenheimer, London, and W. W. Plowman, Surrey, both in England. Represented by E. Noll, Berlin S.W. 61.

533,885. **Products from Butadiene Hydrocarbons.** I. G. Farbenindustrie A. G., Frankfurt a. Main.

533,886. **Polymerization Products.** I. G. Farbenindustrie A. G., Frankfurt a. Main.

535,108. **Conversion Products.** B. F. Goodrich Co., New York, N. Y., U. S. A. Represented by G. Benjamin, Berlin-Charlottenburg.

France

708,501. **Rubber Compounding Mixings.** Deutsche Hydrierwerke, A. G.

708,644. **Vulcanizing Rubber.** Naugatuck Chemical Co.

708,682. **Sponge Rubber.** H. F. de Poix & Co.

708,819. **Vulcanized Rubber.** Dunlop Rubber Co., Ltd.

708,982. **Vulcanizing Process.** R. T. Vanderbilt Co., Inc.

709,068. **Ingredients for Rubber.** I. G Farbenindustrie A. G.

709,187. **Vulcanizing Process.** R. T. Vanderbilt Co., Inc.

709,420. **Vulcanization Method.** Imperial Chemical Industries, Ltd.

709,602. **Vulcanizing Rubber.** Dunlop Rubber Co., Ltd. and Anode Rubber Co., Ltd.

709,637. **Rubberlike Masses.** I. G. Farbenindustrie A. G.

709,712. **Rubber Compounds.** Dunlop Rubber Co., Ltd., and Anode Rubber Co., Ltd.

709,816. **Rubber Covering.** Dunlop Rubber Co., Ltd.

710,078. **Manufacturing Sole Crepe.** E. A. J. Willems.

710,813. **Antiagers.** I. G. Farbenindustrie A. G.

711,131. **Recovering Rubber and Fibers.** A. Bray and J. Demarquay.

711,160. **Coagulating Latex.** Compagnie Francaise de l'Iode et de l'Algine.

711,293. **Improved Sponges.** F. Zapiola.

711,320. **Vulcanized Rubber.** Dunlop Rubber Co., Ltd.

General

United States

18,193 (Reissue). **Electric Connecter.** F. C. Kollath, Chicago, Ill., assignor of ½ to D. Woodhead, Detroit, Mich.

1,820,043. **Heel.** C. F. Benz, Providence, R. I.

1,820,072. **Elastic.** L. W. Joyce, Greensboro, N. C.

1,820,076. **Irrigator.** M. H. Kowan, Chicago, Ill.

1,820,095. **Rubber with Mud Guard.** W. D. Smith, Kalamazoo, Mich.

1,820,120. **Tire Gage Valve.** J. Collins, Charleston, W. Va.

1,820,133. **Resilient Connecter.** H. D. Geyer, assignor to Inland Mfg. Co., both of Dayton, O.

1,820,134. **Freezing Container.** H. D. Geyer, assignor to Inland Mfg. Co., both of Dayton, O.

1,820,149. **Overshoe.** R. J. Mecklenburg, assignor to Mishawaka Rubber & Woolen Mfg. Co., both of Mishawaka, Ind.

1,820,220. **Steering Wheel.** H. D. Geyer, assignor to Inland Mfg. Co., both of Dayton, O.

1,820,221. **Freezing Tray.** H. D. Geyer and F. W. Sampson, assignors to Inland Mfg. Co., all of Dayton, O.

1,820,256. **Sponge and Wash Rag.** R. Stewart, Ozone Park, N. Y.

1,820,338. **Marking Roll.** C. E. Youngchild and J. K. Vanatta, both of Port Edwards, and J. W. Youngchild, Nekoosa, assignors to Nekoosa-Edwards Paper Co., Port Edwards, all in Wis.

1,820,539. **Heel.** D. W. Lewis, assignor of ½ to A. M. Bowzer, both of Lynn, Mass.

1,820,602. **Face Mask.** T. M. Dick, Des Moines, Iowa.

1,820,623. **Hose Protector.** L. L. Lyons, Omaha, Neb.

1,820,681. **Dancer's Illuminating Paraphernalia.** J. Schmalbach, New York, N. Y.

1,820,750. **Flexible Coupling.** H. C. Lord, Erie, Pa.

1,820,766. **Tire.** J. Arico, assignor of ¼ to Sectional Tire Corp., and ¼ to L. Morosini, all of New York, N. Y.

1,820,768. **Comb.** A. A. S. Barker, Southchurch, England.

1,820,769. **Electrotherapeutic Hairbrush.** A. A. S. Barker, Southchurch, assignor to D. Simpson, London, both in England.

1,820,882. **Tractor Band.** E. P. Engstrom, assignor to McNeil Boiler Co., both of Akron, O.

1,821,096. **Drilling and Swabbing Head.** J. N. Hicks, Los Angeles, and C. Severns, Long Beach, both in Calif.

1,821,428. **Overshoe Ornament.** P. E. Fenton, Thomaston, assignor to Scovill Mfg. Co., Waterbury, Conn.

1,821,471. **Overshoe.** P. H. Margulis, New York, N. Y.

1,821,633. **Heel.** B. Gilowitz, New York, N. Y.

1,821,834. **Athletic Shoe.** F. L. Hetter, San Diego, Calif.

1,821,878. **Heel.** J. F. Bradley, assignor of ½ to V. J. Bissonnette, both of Stafford Springs, Conn.

1,821,913. **Nursing Nipple.** J. A. Smith, Attleboro, Mass.

1,821,939. **Shoe Stiffener.** M. G. Hill and T. H. Bristow, both of Leicester, England, assignors to United Shoe Machinery Corp., Paterson, N. J.

1,821,964. **Packing.** G. B. Cutting, Worcester, Mass.

1,822,026. **Vibration Damper.** F. M. Guy, assignor of ½ to T. G. Murton, both of Detroit, Mich.

1,822,135. **Endless Elastic Band.** W. C. Fisher, assignor to Russell Mfg. Co., both of Middletown, Conn.

1,822,190. **Hot Water Bag.** H. Ziele, Napier, New Zealand.

1,822,212. **Hand Grip Sleeve.** R. T. Griffiths, Akron, O., assignor, by mesne assignments, to Miller Rubber Co., Inc., Wilmington, Del.

1,822,320. **Pneumatic Tire and Rim.** A. H. Shoemaker, Seattle, Wash.

1,822,507. **Vibrating Screen.** C. G. A. Schmidt, Jr., assignor to American Road Machinery Co., both of Kennett Square, Pa.

1,822,515. **Undergarment.** E. A. Christman, assignor to Faultless Mfg. Co., both of Baltimore, Md.

1,822,529. **Bracket.** W. C. Keys, Detroit, Mich., assignor to Mechanical Rubber Co., Cleveland, O.

1,822,531. **Undergarment.** A. J. Krein, assignor to Faultless Mfg. Co., both of Baltimore, Md.

1,822,556. **Tire.** W. Barber, Brooklyn, N. Y.

1,822,568. **Inner Tube Protector.** E. Eger, assignor to Morgan & Wright, both of Detroit, Mich.

1,822,592. **Tire Valve.** H. Hutchinson, assignor of ¼ to E. W. Griswell and ¼ to F. Ardrey, all of Absecon, N. J.

1,822,875. **Recoil Pad.** A. H. Ammann, assignor to Jostam Mfg. Co., both of Chicago, Ill.

1,822,966. **Swimming Device.** C. F. Glaeser, Youngstown, O.

1,823,016. **Mallet and Hammer.** J. Widman, Los Angeles, Calif.

1,823,057. **Lace for Footwear.** C. Marx, Berlin, Germany.

1,823,131. **Floor Covering.** J. B. Crockett, assignor to Cambridge Rubber Co., both of Cambridge, Mass.

1,823,134. **Heel.** H. B. Duysen, Elyria, O.

1,823,166. **Wheel.** R. H. Prosser, San Francisco, Calif., assignor, by mesne assignments, to Calrew, Inc., Carson City, Nev.

1,823,391. **Hair Heater.** G. Ducart, Paris, France.

1,823,414. **Tire Gage.** H. N. Thune, Climax, Minn.

1,823,445. **Slipper.** L. Goldstone, assignor to Judsen Rubber Works, both of Chicago, Ill.

1,823,518. **Stocking Protector and Overshoe.** W. D. Walker, assignor to Hookless Fastener Co., Meadville, Pa.

1,823,569. **Pneumatic Cushion.** A. V. Mellano, Thames Ditton, England.

1,823,647. **Hood Corner Protector.** J. F. Duffy, assignor to Duffy Mfg. Co., both of Holland, Mich.

1,823,980. **Steering Wheel.** E. Karrer, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,824,090. **Gear Shift Lever Mechanism.** H. C. Lord, Erie, Pa.

1,824,249. **Fountain Pen.** J. Wallace, Cedarhurst, N. Y.

1,824,289. **Pedal Pad.** J. Milhander, Los Angeles, Calif.

1,824,344. **Securing Dishes on Ships' Tables.** J. Goldberg, Los Angeles, Calif.

1,824,492. **Wall Fixture Attachment.** G. J. Morris, Los Angeles, Calif.

1,824,520. **Wheel.** G. Vordermark, Indianapolis, Ind.

1,824,525. **Traction Device.** H. F. Ames, Grand Rapids, Mich

1,824,560. **Pipe Joint.** J. R. McWane, assignor to McWane Cast Iron Pipe Co., both of Birmingham, Ala.

1,824,601. **Insulated Pipe Covering.** W. W. Knight, Evanston, assignor to Roth Rubber Co., Chicago, both in Ill.

1,824,643. **Gridiron Marker.** F. A. Warren and E. A. Hornby, both of Flandreau, S. D.

1,824,657. **Attachment Plug Cap.** J. S. Coldwell, Milwaukee, Wis., assignor, by mesne assignments, to Cutler-Hammer, Inc., a corporation of Del.

1,824,680. **Tire.** A. S. Norment, Richmond, Va.

1,824,732. **Internal Combustion Engine.** C. R. Paton, assignor to Studebaker Corp., both of South Bend, Ind.

Dominion of Canada

314,712. **Printers' Power Silk Screen.** L. Bland, Rochester, N. Y., U. S. A.

314,750. **Tire.** L. Matlock, Rankin, Tex., U. S. A.

314,929 and 314,930. **Valve Stem.** J. C. Crowley, Cleveland Heights, O., U. S. A.

314,938. **Tire Pressure Signal.** H. G. Gadsby, Toronto, Ont.

314,939. **Shoe.** F. M. Gilkerson, Beloit, Wis., U. S. A.

314,948. **Boot.** M. Jepsen, Varde, Denmark.

315,051. **Multiple Layer Cord Belt.** Goodyear Tire & Rubber Co., assignee of H. E. Morse and R. S. Carter, co-inventors, all of Akron, O., U. S. A.

315,154. **Cog Belt Drive.** A. L. Freedlander, Dayton, O., U. S. A.

315,166. **Tire.** J. C. Hitchner, Philadelphia, Pa., U. S. A.

315,177 and 315,178. **Spring Cover.** D. K. Pope, Cleveland, O., U. S. A.

315,185. **Shoe Cover.** P. Schonfeld, Chemnitz, Germany.

315,284. **Trolley Silencer.** Ohio Brass Co., assignee of E. D. Moore and F. R. Dippman, co-inventors, all of Mansfield, O., U. S. A.

315,285. **Current Collector Support.** Ohio Brass Co., assignee of E. D. Moore and F. R. Dippman, co-inventors, all of Mansfield, O., U. S. A.

315,364, 315,365, and 315,366. **Driving Belt.** A. L. Freedlander, Dayton, O., U. S. A.

315,374. **Head Rest.** W. J. Heintz, Utica, N. Y., U. S. A.

315,460. **Container Cover.** Faultless Rubber Co., assignee of T. W. Miller and A. D. Greene, co-inventors, all of Ashland, O., U. S. A.

315,461. **Container Holder.** Faultless Rubber Co., assignee of T. W. Miller, both of Ashland, O., U. S. A.

315,467. **Slipper.** Judsen Rubber Works, assignee of L. Goldstone, both of Chicago, Ill., U. S. A.

United Kingdom

350,330. **Road Vehicle Undercarriage.** F. Kruckenberg and C. Stedefeld, both of Hannover, Germany.

350,403. **Horseshoe.** L. Chanoux and L. Albisson, both of Vaucluse, France.

350,636. **Aircraft Emergency Exit.** Vickers (Aviation), Ltd., R. K. Pierson, both of Westminster, and G. Stannard, of Vickers (Aviation), Ltd., Surrey.

350,639. **Electrolytic Cell.** Elektrizitats A.-G. Vorm, Schuckert & Co. and A. Fischer, both of Nuremberg, Germany.

350,685. **Leather Dressing Machine.** D. and C. Mercier, both of Annonay, France (trading as Soc. Mercier Frères).

350,714. **Cable.** Callender's Cable & Construction Co., Ltd., London, and J. F. Watson, Kent.

350,823. **Tester.** W. Stejskal and A. Bulcke, both of Berlin, Germany.

350,851. **Surgical Glove.** E. Langer, Berlin, Germany.

350,879. **Tire.** W. Eisenberg and H. Treitel, both of Berlin, Germany.

351,031. **Yielding Bearing.** F. A. Cam, Glamorgan.

351,053. **Razor Strop.** A. E. S. Matarese, Buenos Aires, Argentina.

351,078. **Toothbrush.** C. D. McIver, Surrey.

351,085. **Hydraulic Shock Absorber.** Luvax, Ltd., and H. W. Pitt, both of London.

351,104. **Hair Waver.** L. Berkovi, London.

351,107. **Inflatable Mattress.** L. Pfennig, Cassel, Germany.

351,119. **Wheel.** A. Günzel, Thuringia, Germany.

351,144. **Dust Enclosing Hood.** Tredegar Iron & Coal Co., Ltd., London, and S. Williams, Monmouthshire.

351,155. **Tire Deflation Indicator.** D. McIntosh, Sunderland.

351,257. **Compound Transparent Sheet.** A. V. Johnson, Staffordshire.

351,269. **Paint Brush.** A. C. and A. S. Leng (trading as C. H. Leng & Sons), both of Birmingham.

351,314. **Surgical Appliance.** W. Kirk, Dundee.

351,321 and 351,326. **Land Working Machine.** Siemens-Schuckertwerke A.-G., Berlin, Germany.

351,330. **Hanger.** P. Picard, Neuilly-sur-Seine, France.

351,373. **Mat.** F. F. Ringstrom, Malmo, Sweden.

351,376. **Tourniquet.** W. A. Owen, Toledo, O., U. S. A.

351,474. **Plug Coupling.** Kabel-Fabric Akt.-Ges., Bratislava, Czechoslovakia.

351,603. **Cable Armouring.** Macintosh Cable Co., Ltd., and A. Sargent, both of Derby.

351,622. **Cable.** W. S. Smith, Devon, and H. J. Garnett and J. N. Dean, both of Kent.

351,681. **Electrocuting Whales.** B. Holm-Hansen, Oslo, Norway.

351,721. **Endless Belt Conveyer.** Leyland & Birmingham Rubber Co., Ltd., Leyland, and R. W. Lunn, Lancashire.

351,784. **Tire Tread.** J. Mitchell, Essex, and Non-Skid Tyre Syndicate, Ltd., London.

351,834. **Tire Deflation Signal.** E. M. Mueller, Welcome, Minn., U. S. A.

351,915. **Tire.** C. Eberle, Haut-Rhin, France.

352,013. **Coupling.** F. Faudi, Dusseldorf, Germany.

352,022. **Medical Douche.** C. A. Cofman-Nicoresti, Middlesex.

352,041. **Cable.** A. W. Clegg, Lancashire.

352,186. **Cable.** Siemens - Schuckertwerke A.-G., Berlin, Germany.

352,224. **Pocket Wallet Retainer.** T. Hewitt and H. White, both of Horbury.

352,257. **Ash Tray.** D. A. Macfie, London.

352,327. **Cable.** British Thomson-Houston Co., Ltd., London, assignee of C. O. Hull, Bridgeport, Conn., U. S. A.

352,330. **Brush.** G. Glover, Birmingham.

352,349. **Toothbrush.** H. R. Priest, Loudonville, O., U. S. A.

352,522. **Loom Picker.** International General Electric Co., Inc., New York, N. Y., U. S. A., assignee of Allegemeine Elektricitäts-Ges., Berlin, Germany.

352,577. **Bathing Cap.** T. J. Howland, Long Branch, N. J., U. S. A.

352,755. **Parallel Ruler.** O. E. Soderman and A. R. Nelson, both of New York, N. Y., U. S. A.

352,757. **Radioactive Material.** H. Hense, Huls, Germany.

352,827. **Torsional Oscillation Damper.** O. Föppl, Brunswick, Germany.

Germany

533,397. **Driving Belt.** Continental Gummiwerke A. G., Hannover.

533,398. **Cogged Driving Belt.** F. Luthner, Solingen.

533,651. **Tire Cover.** P. Klein and Ungarische Gummiwaarenfabriks-A. G., Budapest, Hungary. Represented by C. Clemente, Berlin S.W. 61.

533,652. **Tire.** C. G. Worsley and P. L. Harkin, both of Carlton, Australia. Represented by G. Winterfeld, Berlin S.W. 68.

533,725. **Hot Water Bottle.** Dunlop Rubber Co., Ltd., London, England. Represented by R. and M. M. Wirth, C. Weihe, and H. Weil, all of Frankfurt a. M., and T. R. Koehnhorn, Berlin S.W. 11.

533,898. **Link Block Belt.** H. Lacroix, Geneva, Switzerland. Represented by A. Kuhn, Berlin S.W. 61.

534,175. **Tire.** G. Dreher, Berlin-Charlottenburg.

534,761. **Hose.** Hydraulic Brake Co., Detroit, Mich., U. S. A. Represented by G. Benjamin and H. F. Wertheimer, both of Berlin.

Designs

1,183,784. **Cell Tube.** W. Mollmann, Wittenberg, Bez. Halle.

1,183,908. **Tire Mudguard.** H. Rutershoff, Dortmund-Berghofer.

1,183,920. **Valve Ring.** Pahlsche Gummi & Asbest-Gesellschaft m. b. H., Dusseldorf-Rath.

1,184,126. **Nonskid Tread.** S. Aronheim, Berlin-Charlottenburg.

1,184,231. **Nonskid Tread.** Continental Gummiwerke A. G., Hannover.

1,184,366. **Tube-Tire.** W. Reimann, Berlin-Wilmersdorf.

1,184,485. **Barbers' Neck Protector.** A. Siffczyk, Slawikau, Kr. Ratibor i. O. S.

1,184,502. **Mat.** Firma Alfred Kuhn, Bad Liebenwerda.

1,184,560. **Closure for Hollow Bodies.**

Munden-Hildesheimer, Gummiwaaren-Fabriken Gebr. Wetzell A. G., Hildesheim.

1,184,843. **Decorating Stamp.** Firma J. Bergeon, Gelnhausen, Hessen-Nassau.

1,184,914. **Suction Hose.** Inventia Patent - Verwertungs - Gesellschaft, Schaffhausen, Switzerland. Represented by W. Zimmermann and E. Jourdan, both of Berlin S.W. 11.

1,185,084. **Oil Hose.** Berliner Gummiwaaren-Fabrik Paersch & Kerstan, Berlin S.W. 68.

1,185,125. **Block Belt.** Fr. Moller G. m. b. H., Brackwede i. W.

1,185,193. **Arrangement of Bladder in Balls.** P. Petroll, Bischdorf-Gross-Wartenberg, Bez. Breslau.

1,185,257. **Tar Hose.** Hansens Gummi & Packungswerke Paul & John Hansen Hannover-Wulfel.

1,185,405. **Heel.** Fischer & Hertel, Dusseldorf-Gerresheim.

1,185,682. **Sole.** O. Korting, Hameln a. d. W.

1,185,689. **Heel with Mud Guard.** A. Prell, Bamberg.

1,185,859. **Football Bladder.** Barckhausen & Co., Harburg-Wilhelmsburg.

1,185,868. **Wheel Hub.** Dunlop Rubber Co., Ltd., London, England. Represented by B. Kaiser and E. Salzer, both of Frankfurt a. Main.

1,185,930. **Fountain Pen.** Moster-Pen kala G. m. b. H., Berlin S.W. 68.

1,186,037. **Toy Ring.** E. Leitner, Berlin S.W. 29.

1,186,108. **Bathing Cap.** I. B. Kleinert Rubber Co., G. m. b. H., Hamburg.

1,186,223. **Tire.** Dunlop Rubber Co., Ltd., London, England. Represented by B. Kaiser and E. Salzer, both of Frankfurt a. Main.

1,186,282. **Tire.** K. R. Thumser, Vienna, Austria. Represented by G. Rauter, Berlin W. 9.

1,186,334. **Heel.** Bremer Leder-Grosshandels-Gesellschaft m. b. H., Bremen.

1,186,352. **Porous Rubber Band.** C. Sterthues, Wuppertal-Barmen.

1,186,447. **Rubberized Rope.** Franz Clouth Rheinische Gummiwarenfabrik A. G., Hannover.

1,186,498. **Billiard Ball.** New York Hamburger Gummi - Waaren Co., Hamburg.

1,186,499. **Toy.** New York Hamburger Gummi-Waaren Co., Hamburg.

1,186,500. **Skittle Ball.** New York Hamburger Gummi - Waaren Co., Hamburg.

1,186,597. **Heel.** Continental Gummiwerke A. G., Hannover.

1,186,632. **Doll's Apron.** A. P. Wyschogrod, Berlin N. 24.

France

709,564. **Wheel.** Dunlop Rubber Co., Ltd.

710,859. **Gaiter.** L. Bonnet.

Trade Marks

United States

286,340. **Truco.** Prophylactic and membranous articles. S. Kohn, doing business as Thrift Rubber Co, Newark, N. J.

286,376. **Duralowood.** Golf balls. Donaldson Mfg. Co., Ltd., Glasgow, Scotland.

286,400. Word: **"Pepsin"** within a fanciful design. Chewing gum. Wm. Wrigley, Jr., Co., Chicago, Ill.

286,401. Representations of a mortar and a pestle, a fanciful design, and a pair of scales. Chewing gum. Wm. Wrigley, Jr., Co., Chicago, Ill.

286,402. Representation of two boys and a large disk. Chewing gum. Orbit Listerated Gum Co., Chicago, Ill.

286,444. Representation of a shield upon two crossed battleaxes, and bearing the word: **"Premier."** Prophylactic articles. T. Kaplan, doing business as Midwest Drug Co., Minneapolis, Minn.

286,445. **Parisians.** Prophylactic articles. A. Cassett, New York, N. Y.

286,452. **Foot Model.** Footwear. Cedar Grove Shoe Mfg. Co., Cedar Grove, Wis.

286,458. **Norwich.** Raincoats. United States Rubber Co., New York, N. Y.

286,481. **Silverdale.** Raincoats. Silvertex Co., Philadelphia, Pa.

286,525. **Lucky Penny.** Chewing gum. Orbit Listerated Gum Co., Chicago, Ill.

286,533. **Match Play.** Golf balls. National Bellas Hess Co., Inc., New York, N. Y.

286,585. **Sunsandl.** Footwear. W. Greilich & Sons, Inc., Brooklyn, N. Y.

286,623. **Soled Sox.** Footwear. C. B. Barndollar, Oakland, Calif.

286,673. **Daylong.** Footwear. S. Troy & Co., Inc., Brooklyn, N. Y.

286,680. **Lastex.** Yarns. Adamson Bros. Co., assignor to United States Rubber Co., both of New York, N. Y.

286,745. **Emsco.** Sanitary goods. J. W. Goldsmith, doing business as Empire Shield Co., New York, N. Y.

286,763. A Parallelogram containing the words: **"Stick Fast."** Tube patches. O. W. Hoelbinger, doing business as O. H. Rubber Co., Folsom, Pa.

286,766. Diamond between the words: **"Flex"** and **"Tire Plaster."** Tire patches. T. Bell, doing business as Bell Supply Co., Richmond, Va.

286,790. **Town & Country.** Tires and tubes. Marshall Field & Co., Chicago, Ill.

286,795. Representation of a section of hose. Hose. Eureka Fire Hose Mfg. Co., New York, N. Y.

286,848. **Lafatmud.** Hosiery protector. O. Hein, New York, N. Y.

286,873. **Sharpont.** Erasers. Scripto Mfg. Co., Atlanta, Ga.

286,879. **St. Regis.** Combs. McKesson & Robbins, Inc., Bridgeport, Conn.

286,921. Representation of a woman holding a shoe. Footwear. E. Movsesian, Haverhill, Mass.

286,956. **Softex.** Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

286,968. Oval within a border containing the words: **"Edwards & Walker Company. Portland, Maine, U. S. A.,"** and a representation of a lion with one paw upon a representation of a golf ball, and thereon the word: **"It."** Golf balls. Edwards & Walker Co., Portland, Me.

286,970. **Ace.** Swimming belts. A. Walus, Brooklyn, N. Y.

286,988. **Beaver.** Inner tubes, tire patches, boots and sleeves for automobile tires. Badger Rubber Works, Milwaukee, Wis.

287,075. **Marvel Whirling Fountain.** Fountain and douche syringes. Marvel Co., New Haven, Conn.

287,092. **Twillette.** Elastic webbing. United Elastic Corp., Easthampton, Mass.

287,094. **Wiltex.** Gloves. Wilson Rubber Co., Canton, O.

287,106. **Duride.** Inner soles. United States Rubber Co., New York, N. Y.

287,150. **Voix d'Or, "Voice of Gold."** Medicated chewing gum. B. J. Clark, doing business as Voix d'Or, S. Minneapolis, Minn.

287,183. The words: **"Bill & Bob"** within a fanciful design. Footwear. Endicott Johnson Corp., Endicott, N. Y.

287,190. Parallelogram containing representation of a shield bearing the letter **"P,"** all between the words: **"Superior Quality."** Heels. Panther Rubber Mfg. Co., Stoughton, Mass.

287,194. **Optimus.** Prophylactic articles. R. J. Pierce, Inc., New York, N. Y.

287,209. **Windtex.** Raincoats. United States Rubber Co., New York, N. Y.

287,244. **Amerite.** Insulated wire and cable. American Steel & Wire Co. of New Jersey, Cleveland, O.

287,245. **Amparak.** Insulated wire and cable. American Steel & Wire Co. of New Jersey, Cleveland, O.

287,278. **Setry.** Footwear. S. Troy & Co., Inc., Brooklyn, N. Y.

287,302. **Sta-Hot.** Medical appliances. Sta-Hot Products Co., Oak Park, Ill.

287,427. **Noshoc.** Recoil pad. Seamless Rubber Co., Inc., New Haven, Conn.

Dominion of Canada

52,857. Word: **"Stearex"** around which are two concentric circles between which appear the words: **"Sterling Rubber Company Limited Guelph Canada."** Rubber goods. Sterling Rubber Co., Ltd., Guelph, Ont.

52,884. **Western Weld.** Tire and tube repair kits, rubberized merchandise, etc. Western States Mfg. Co., Inc., Sioux City, Ia., U. S. A.

52,949. **Klinger-Oilit.** Rubber asbestos. Rice, Klinger Gesellschaft m.b.H., Gumpoldskirchen, Austria.

52,955. **Premier.** Erasers and rubber bands. Venus Pencil Co., Ltd., Toronto, Ont.

52,956. **Utility.** Erasers and rubber bands. Venus Pencil Co., Ltd., Toronto, Ont.

52,972. **Zeppelin.** Soles and heels. Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont.

United Kingdom

519,231. **Globus.** Goods not included in other than Class 40. Harboro' Rubber Co., Market Harborough, Leicestershire.

523,577. Double circle, containing the word: **"Allblak."** Tubes and tires. India Tyre & Rubber Co. (Great Britain), Ltd., Inchinnan, Renfrewshire.

524,610. **Robac.** Accelerators and antioxidants. Robinson Bros., Ltd., Birmingham.

524,826. **Gumotex.** Goods not included in other than Class 40. Magyar Ruggyantaárugyár Részvénytársaság, Budapest X, Hungary.

—EDITOR'S BOOK TABLE—

New Publications

"Sixth Annual Report—1931." The Rubber Exchange of New York, Inc. This pamphlet contains the brief annual report of the president of the Exchange and that of its treasurer. Trading on the Exchange for the year ended September 14, 1931, resulted in 38,529 contracts amounting to 220,995 tons. The present membership is 255, of which 203 are in the United States—29 in England, 11 in France, 7 in Holland, 2 in Germany, and 1 each in Ceylon, China, and Australia.

"Rubber and Railways." By Colin Macbeth, The Rubber Growers' Association, Inc., 2 Idol Lane, Eastcheap, London, E.C.3, England. This pamphlet of 61 pages discusses the rubber goods used by the railways of Britain, France, and America, also standards and tests and a brief discussion of concentric rubber springs as applied by British railways for drawbar gear. A summary of effective use of rubber on railways is given. There is a general index and the text has 60 illustrations.

It is true that for car heating the use of rubber steam hose has met with a set-back on American railways because it cannot survive the heavy pressure necessary to force the steam from front to rear of long passenger trains. The author's statement that steam hose "cannot be used after October, 1931," somewhat overstates the situation. It is still in service although destined ultimately to be abandoned for steam connections on long passenger trains.

"Reclaimed Rubber." A. T. McPherson. Circular of the Bureau of Standards No. 393. U. S. Department of Commerce, Washington, D. C. This circular, prepared to meet requests for information about reclaimed rubber, outlines the reclaiming process, composition of reclaimed rubber, its classification, properties, and uses. The circular tells why reclaiming on a small scale is not practicable and concludes with a classified bibliography of publications on reclaimed rubber.

"Diamond Rubber Belting, Hose, and Packing." The Diamond Rubber Co., Inc., Akron, O. This 12-page catalog illustrates and describes in detail the various types of belting, hose, packing, mats, matting, and miscellaneous mechanical items.

"Methods of Test Relating to Electrical Insulating Materials. Report of Committee D-9 on Electrical Insulating Materials, 1931." American Society for Testing Materials, Philadelphia, Pa. This pamphlet contains, in addition to the current report of Committee D-9, the methods of testing for insulating that have been developed by the American Society for Testing Materials. It is published for the purpose of presenting under a single cover what the Society believes would be of importance to those interested in making tests on insulating materials.

Book Review

"Chemical Engineering Catalog." Sixteenth Ed., 1931. Published by The Chemical Catalog Co., Inc., New York, N. Y. Cloth, 1017 pages, 9 x 12 inches. Illustrated.

The latest edition of this well-known standard reference work, although containing somewhat fewer pages than the previous edition, more fully develops the amount of detailed information supplied by the firms represented. The volume comprises the following sections: Alphabetical Index, Trade Name Index, Classified Index of Equipment and Supplies, Classified Index of Raw Materials, Chemicals and Raw Materials Section, and Technical and Scientific Book Section.

"Bulletin No. 385. Royle Perfected Tubing Machine No. ½." John Royle & Sons, Paterson, N. J. This 4-page illustrated bulletin is devoted to a description of the smallest Royle tuber. This machine with a cylinder of 1⅛ inches diameter is particularly adapted to the production of small items, covering small wire, and laboratory use. It is usually built for belt drive, in which case countershaft and pulleys are included in selling completeness.

"Firestone Rubber and Canvas Footwear." Firestone Footwear Co., Hudson, Mass. A large red folder with a pocket is supplied dealers to keep easily iled the four- and six-page illustrated circulars describing Firestone footwear. In the first lot are included circulars A-1, "Lumbermen's Oregons, Heavy Arctics"; B-1, "Boots"; G-1, "Gaiters"; R1, "Light and Heavy Rubbers"; and S1, "Packing Schedule, Lasts, Sole Patterns, Terms."

"The Merchants' Association of New York Year Book, 1931." The Merchants' Association of New York, Woolworth Bldg., 233 Broadway, New York, N. Y. This year book contains what is regarded by many as the best selective alphabetical and classified compilation of prominent concerns in the trades, industries, and professions, published in New York City. The names cover the membership of the association as of September 2, 1931, approximately 6,000. The information given is so comprehensive as to constitute a most valuable directory of individuals, firms, and corporations.

"1931 Supplement to Book of A. S. T. M. Standards." American Society for Testing Materials, 1315 Spruce street, Philadelphia, Pa. This 144-page pamphlet, the first supplement to the 1930 Book of A. S. T. M. Standards, contains 32 standards adopted or revised by letter ballot of the Society on September 1, 1931. It also contains a list of Standards and Tentative Standards as of September, 1931; of these, 443 are of the former class and 180 of the latter; total, 623.

Five-Day Week?

While many companies now work their employes on a short-time basis, few are yet prepared to say that the five-day week will be permanently adopted, was disclosed by an inquiry conducted by The Merchants' Association of New York among fourteen large manufacturing plants, greatly diversified as to products and involving approximately 200,000 employes. The survey, following the United States Rubber Co.'s announcement of a permanent five-day week, was intended to learn to what extent industry generally is inclined to look upon the five-day week as one solution of future problems.

Only two companies reported seriously considering the permanent establishment of the five-day week. Some of the others said it was a matter to be considered, but they were holding in abeyance the decision until industry shows signs of righting itself.

One large company announced it was operating one of its plants five days a week and another five-and-one-half days to compare the efficiency of the two systems.

The results of the survey are shown in the following analysis:

Company A operates at present on a three-to-five-day week. No policy for the future has been adopted.

Company B operates on a three-to-five-day week. While no definite action has been taken, it believes the trend is toward the permanent establishment of a five-day policy.

Company C is now on a five-day week, with no future plans.

Company D is actively interested in the five-day week as a permanent industrial change, which it is considering.

Company E's office force is on a five-day week. Shop operates from three to five days. It has no future plans.

Company F, now on a five-day week, considers the possibility of remaining on this schedule after the depression, but has taken no definite action.

Company G has two plants, one on a five-day week and one on a five-and-one-half day week, to compare the efficiency of the two systems for a year.

Company H is now on a five-day week, but it is not permanent.

Company I, now on a short work week, is considering a permanent five-day week.

Company J is now on a forty-hour week, but is open to expansion when business conditions warrant it.

Company K now works 38¾ hours. It is too early to say what will be done when business is better.

Company L, now on a five-day week, has not officially considered a permanent five-day week.

Company M has its machine shop on a five-day week, seven hours daily, and foundry on a four-day week. It has not considered permanently establishing a five-day week.

Company N is on a five-day week temporarily. No consideration is given to establishing permanently this system.

Market Reviews

Crude Rubber

New York Exchange

THE rise in rubber prices toward the latter part of the month was primarily in response to firmer cables from London where the devaluated pound was responsible for an increase in quotations. But when the trade became informed of the lower freight rates from the Far East, the market turned soft. The statistical position again came to the fore, and traders were forced to realize that the immediate effect of the lower rates would be unfavorable.

Merchants in the Far East made a rush to take advantage of the new terms, with the result that September shipments from Malaya are estimated at 46,000 tons. With imports increasing, indications are that world stocks will again be increased. This condition, of course, may be only temporary. The saving of about ¼-cent will probably be cancelled in the market under the weight of the increased shipments.

Business in the automobile and tire industries is naturally at a low ebb this time of year; while the shutdowns by automobile manufacturers promise an even greater than seasonal decline in output. Automobile men, in fact, are not looking for improvement until after the turn of the year when it is expected that the plans being formulated by the federal administration will take effect, and buying be resumed at a rate approaching normal.

Evidence of the large potential buying power was given by R. H. Grant at a meeting of the National Automobile Chamber of Commerce, where he said: "Our analysis of the automotive industry's position indicates that there is a shortage of 12,000,000 car miles in the nation's motor vehicle inventory and that this translated into terms of replacement requirements will form the backlog of 1932 motor buying."

On Friday, September 25, the market hit the low record when the old September "A" contract sold at 4.40 cents. Saturday's market remained at about the levels reached on Friday.

The interest of the market, of course, was focussed on London. The drop in prices followed the belief that the English were not adjusting themselves to the lower pound basis. Prices there, however, were much stronger because, as the pound declined in value, the price of commodities had to increase to conform with the new prices.

Prices at the close of September 26 on No. 1 standard contract were:

Position	High	Low	Close	Previous Close
Sept.	....	....	4.63	4.60
Oct.	4.68	4.68	4.68	4.65/4.70
Nov.	....	....	4.71	4.69
Dec.	4.75	4.75	4.75/4.80	4.74
Jan.	....	....	4.80	4.79
Feb.	....	....	4.85	4.84
Mar.	4.91	4.90	4.90	4.89
Apr.	....	....	4.97	4.96
May	5.03	5.03	5.05	5.03/5.05
June	....	....	5.10	5.08
July	....	....	5.15/5.18	5.13/5.16
Aug.	....	....	5.25	5.23
Spot	....	....	4.75	4.73

Week ended October 3. In a dull market rubber prices on the whole were steady and for the week showed gains of from 2 to 10 points. The largest day's business totaled 672½ tons, the average being 380 tons per day. The London market was also dull but ended with a firm tone on Saturday, prompting a rise of from 7 to 13 points in our market. The general weakness in the stock market was felt somewhat in the rubber market.

Dutch and Malayan rubber shipments were announced during the week. Crude rubber shipments from the Dutch East Indies during August amounted to 22,437 tons, compared with 25,293 tons during July, and 23,036 in August, 1930. Gross shipments of crude rubber by Malaya amounted to 44,336 tons during September compared with 42,832 tons during August and 49,229 tons during September, 1930.

Ceylon's exports were larger also, being 4,195 tons in September compared with 3,756 tons during August and 7,878 tons for September last year. The United States received 3,033 tons in September from Ceylon against 2,796 in August and 4,942 in September, 1930.

The Department of Commerce reported

RUBBER BEAR POINTS

1. Lower freight rates from the Far East will probably result in increased shipments.
2. Tire output declined 20.7 per cent in August; shipments declined 9.2 per cent.
3. Automobile output has declined more than seasonally.
4. Sales of automobiles were approximately 118,000 units in September against 155,709 in August and 175,286 in September, 1930.
5. Estimates put October Malayan shipments at 46,000 tons against 44,336 in September and 42,832 in August.
6. Output on small Malayan estates in September was 16,593 tons, against 15,106 during August; on estates over 100 acres, September output was 20,240 tons against 20,941 tons during August.
7. Consumption in the United States during September was 23,638 tons, or 14 per cent less than in August, and more than 7 per cent less than in September last year.
8. Imports of crude rubber to the United States during September were 40,505 tons, an increase of 5.6 per cent over August and 2.6 per cent over September, 1930.
9. Domestic stocks of rubber on hand on September 30 were 254,324 tons, an increase of 5.6 per cent over August, and 49.7 per cent over September 30, 1930.
10. The British and Dutch were unable to get together on restriction.

RUBBER BULL POINTS

1. Stocks of tires on hand September 1 were 18 per cent less than at the same date a year ago.
2. Dealers' stocks of rubber in the Far East on September 30 were 39,368 tons against 42,393 at the end of August and 36,611 at the end of September last year.
3. Estate stocks in Malaya at September 30 were 22,036 tons, against 23,855 at the end of August; dealers' holdings were 18,248 tons against 20,126 tons last September.
4. A $15,000,000 credit corporation was formed in Akron to stabilize the local banking structure, and two of Akron's largest banks were merged. The rubber companies were large subscribers in this unusual civic achievement.
5. Imports or crude rubber to Great Britain during September were only 7,139 tons against 8,455 in August and 18,864 in September, 1930.
6. Estimates were made of a large shortage in car miles run this year, indicating a large potential demand.

The Rubber Exchange of New York, Inc.

DAILY MARKET FUTURES—RIBBED SMOKED SHEETS—CLEARING HOUSE PRICES—CENTS PER POUND—NO. 1 STANDARD CONTRACTS

Positions 1931	September, 1931					October, 1931								
	25	26	28	29	30	1	2	3	5	6	7	8	9	10
Sept.	4.60	4.63	..	4.45	...	...	...	...	...	...	...	...	...	...
Oct.	4.65	4.68	4.65	4.50	4.50	4.55	4.53	4.65	4.57	4.73	4.80	4.90	4.93	4.85
Nov.	4.69	4.71	4.67	4.57	4.57	4.64	4.60	4.72	4.61	4.77	4.85	4.95	4.98	4.90
Dec.	4.74	4.75	4.70	4.65	4.64	4.73	4.67	4.80	4.66	4.82	4.90	5.00	5.03	4.95
1932														
Jan.	4.79	4.80	4.75	4.70	4.69	4.78	4.73	4.85	4.72	4.87	4.95	5.05	5.08	5.00
Feb.	4.84	4.85	4.81	4.76	4.74	4.83	4.79	4.90	4.78	4.92	4.99	5.10	5.13	5.05
Mar.	4.89	4.90	4.85	4.81	4.79	4.89	4.85	4.95	4.83	4.98	5.04	5.15	5.18	5.10
Apr.	4.96	4.97	4.93	4.87	4.85	4.94	4.91	5.00	4.89	5.04	5.10	5.20	5.21	5.18
May	5.03	5.05	5.00	4.94	4.92	5.00	4.98	5.05	4.95	5.10	5.16	5.26	5.25	5.25
June	5.08	5.10	5.05	4.99	4.98	5.06	5.02	5.11	5.01	5.17	5.23	5.32	5.32	5.31
July	5.13	5.15	5.10	5.04	5.05	5.12	5.07	5.17	5.08	5.25	5.30	5.39	5.40	5.37
Aug.	5.23	5.25	5.20	5.14	5.15	5.20	5.17	5.26	5.15	5.31	5.37	5.47	5.47	5.43
Sept.	...	...	...	...	...	5.30	5.27	5.35	5.22	5.38	5.45	5.55	5.55	5.50

Positions 1931	October, 1931												
	12*	13	14	15	16	17	19	20	21	22	23	24	26
Sept.	...	...	...	...	...	...	...	...	...	...	...	...	...
Oct.	...	4.85	4.85	4.85	4.95	4.95	5.05	5.20	5.07	5.00	4.92	4.70	4.50
Nov.	...	4.90	4.90	4.90	4.98	4.98	5.08	5.25	5.11	5.00	4.94	4.72	4.54
Dec.	...	4.95	4.95	4.95	5.00	5.00	5.10	5.28	5.15	5.00	4.96	4.75	4.58
1932													
Jan.	...	5.00	5.00	5.01	5.07	5.07	5.18	5.34	5.22	5.06	5.02	4.82	4.64
Feb.	...	5.04	5.05	5.07	5.14	5.14	5.26	5.40	5.29	5.11	5.08	4.89	4.70
Mar.	...	5.09	5.10	5.13	5.20	5.20	5.35	5.45	5.36	5.17	5.15	4.97	4.75
Apr.	...	5.17	5.16	5.19	5.29	5.28	5.42	5.52	5.43	5.23	5.20	5.05	4.82
May	...	5.25	5.23	5.26	5.38	5.36	5.50	5.59	5.51	5.29	5.26	5.13	4.90
June	...	5.31	5.31	5.33	5.44	5.43	5.56	5.66	5.56	5.36	5.33	5.17	4.98
July	...	5.37	5.40	5.40	5.50	5.50	5.62	5.74	5.62	5.43	5.41	5.22	5.06
Aug.	...	5.45	5.46	5.48	5.57	5.56	5.69	5.80	5.70	5.51	5.49	5.28	5.12
Sept.	...	5.54	5.53	5.56	5.65	5.63	5.76	5.87	5.78	5.60	5.57	5.35	5.19

*Holiday.

that August production of automobiles was 187,197 vehicles, the lowest since last January, when the figure was 171,848. Output in July was 218,490 vehicles and 224,368 in August, 1930. For the first 8 months of 1931 production was 1,978,622 units compared with 2,688,481 in the same period last year.

September output, as indicated by the *Times'* index, will be even lower than for August. The index for the week ended September 26 stood at 43.9 against 45.2 for the preceding week and 53.4 for the corresponding week last year.

There has been no news about restriction for some time. Whether this lack of news means that all efforts have been abandoned is hard to say; but the longer such action is delayed, the more convinced do traders become that artificial restriction will not alleviate the distress of the rubber industry.

The feeling prevails that rubber shipments will fall off in the next 3 months, so the statistical position should show some improvement. Indicated 1931 output from Malaya was estimated at 439,000 tons at the end of August. This estimate is based on the amount of rubber already shipped, and it has shown a slight decline in every month since March.

Prices at the close of October 3 on No. 1 Standard contract were:

Position	High	Low	Close	Previous Close
Oct.	4.60	4.60	4.65	4.53
Nov.	....	....	4.72	4.60
Dec.	....	....	4.80	4.67
Jan.	....	....	4.85	4.73
Feb.	....	....	4.90	4.79
Mar.	4.95	4.91	4.95	4.85/4.90
Apr.	....	....	5.00	4.91
May	5.06	5.06	5.05/5.10	4.98
June	....	....	5.11	5.02
July	5.20	5.20	5.17/5.20	5.07/5.10
Aug.	....	....	5.26	5.17
Sept.	5.35	5.35	5.35	5.27/5.30
Spot	....	....	4.70	4.60

Week ended October 10. Gains of 15 to 20 points for the week were made largely as the result of outside influences such as President Hoover's plan for liquidating frozen assets, and the action of the stock market.

Automobile output continues to show more than a seasonal decline, with production in the week ended October 10 at 32,253 units, according to Cram's Automotive Reports, compared with 39,186 units in the preceding week and 41,289 units in the corresponding week last year.

The figures showing detailed allotments of Malayan shipments for September were released, and showed that 29,476 of the total 44,336 tons exported, came to the United States. This compares with 27,634 tons to the United States in August, and 27,344 tons in September, last year.

During September smaller shipments were reported to the United Kingdom and the Continent; while Japan, which has been increasing its takings of the commodity this year, imported 3,791 tons against 3,541 tons in August and 3,470 tons in September, 1930.

A cable to the Rubber Exchange about restriction declared that J. H. Thomas, Colonial Secretary in the British cabinet, will not approach the Dutch Government on a conference between the world's foremost rubber producing countries. Replying to a suggestion from the Ceylon industry that a triangular conference be held between British Malaya, Dutch East Indies, and Ceylon to discuss rubber restriction, Mr. Thomas regrets the impossibility of approaching the Governor General of the Dutch East Indies on the matter because he understands that the Dutch are initiating conversations at present toward that end.

As Mr. Julian said last week, perhaps it is just as well that we have a "free, open market, with the immutable law of supply and demand fixing the price of the commodity." It may be that when the Dutch and British finally get around to their "conversations," there will be no need for them.

A decline was registered in dealers' stocks in the Far East during September. At September 30 the stocks were 38,411 tons against 42,393 tons at the end of August and 36,618 tons at the end of September a year ago. Harbor Board stocks, however, were up, those at Singapore and Penang amounting to 7,657 tons against 5,617 tons at the close of August.

Prices at the close of October 10 on No. 1 Standard contract were:

Position	High	Low	Close	Previous Close
Oct.	....	....	4.85	4.93
Nov.	....	....	4.90	4.98
Dec.	4.91	4.91	4.95	5.03
Jan.	....	....	5.00	5.08
Feb.	....	....	5.05	5.13
Mar.	5.08	5.08	5.10/5.15	5.18
Apr.	....	....	5.18	5.21
May	....	....	5.25	5.25
June	....	....	5.31	5.32
July	....	....	5.37	5.40
Aug.	....	....	5.43	5.47
Sept.	....	....	5.50	5.55
Spot	....	....	4.88	4.95

Week ended October 17. For 3 consecutive days the market was practically stationary, with little rubber changing hands, and the small gain that was registered on Friday was simply in sympathy with the stock market and due to professional trading. The September consumption report was bearish, but firmness in the London-Singapore cables held the market to the levels at which it had opened the week.

RUBBER EXCHANGE ACTIVITIES

Transactions

Week Ended	Contracts Sold: Number	Contracts Sold: Tons	Transferable Notices	Week-End Tone
Sept. 26	524	1,310.0	45	Dull
Oct. 3	243	607.5	21	Steady
Oct. 10	201	502.5	4	Dull
Oct. 17	216	540.0	4	Quiet
Oct. 24	400	1,000.0	3	Easy
Totals	1,584	3,960.0	77*	

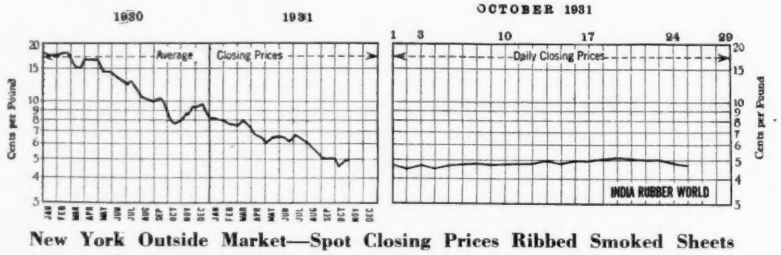
*Actual deliveries of rubber.

The Rubber Manufacturers' Association reported consumption of crude rubber by manufacturers in the United States during September at 23,638 long tons, a decrease of 14 per cent from August in face of a normal decline of 11 per cent. The consumption in September, last year, was 25,515 tons. Imports of crude rubber in September totaled 40,505 long tons, an increase of 5.6 per cent over the August figure, and 2.6 per cent more than in September, 1930. Total domestic stocks of crude rubber on hand on September 30 were estimated at 254,324 long tons, an increase of 5.6 per cent over August, and 49.7 per cent over September 30, 1930.

Great Britain imported only 7,139 tons of rubber in September compared with 8,455 in August and 18,864 tons during September, 1930. The September exports were 1,671 tons compared with 3,424 tons in August and 2,849 tons during September, 1930.

After refraining to comment on the rubber market for many months because of the belief that no fundamental change had taken place, Geo. H. McFadden & Bro. published an extensive bulletin on October 9 in which appeared the following:

". . . As regards the crude rubber in-



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

	September, 1931									October, 1931													
	21	22	23	24	25	26	28	29	30	1	2	3	5	6	7	8	9	10	12*	13	14	15	16	17
Ribbed Smoked Sheet	5	4 11/16	5 1/16	4 7/8	4 3/4	4 3/4	4 13/16	4 13/16		4 11/16	4 5/8	4 11/16	4 5/8	4 3/4	4 11/16	4 11/16	4 7/8	4 7/8	...	4 7/8	5	4 7/8	5	5
No. 1 Thin Latex Crepe	5 3/16	5 3/16	5 1/2	5 1/4	5 1/16	5 1/16	5 1/4	4 7/8	4 7/8	5 1/16	5	5 1/16	5	5 1/16	5 1/16	5 1/4	5 1/4	5 1/4	...	5 1/16	5 1/4	5 1/4	5 3/16	5 3/16
No. 1 Thick Latex Crepe	5 1/8	5 1/8	5 1/4	5 1/8	4 7/8	4 7/8	4 11/16	4 3/4	4 3/4	4 7/8	4 3/4	4 7/8	4 7/8	5	5	5 1/8	5 1/16	5	...	5 1/16	5 1/8	5	5 1/8	5 1/4
No. 1 Brown Crepe	4 3/4	4 3/4	4 7/8	4 5/8	4 5/8	4 5/8	4 5/8	4 1/2	4 1/2	4 9/16	4 9/16	4 9/16	4 1/2	4 5/8	4 5/8	4 5/8	4 5/8	4 5/8	...	4 5/8	4 11/16	4 5/8	4 3/4	4 3/4
No. 2 Brown Crepe	4 3/8	4 3/8	4 3/4	4 1/2	4 1/2	4 1/2	4 1/2	4 3/8	4 3/8	4 1/2	4 7/16	4 7/16	4 3/8	4 1/2	4 1/2	4 1/2	4 1/16	4 1/2	...	4 1/2	4 5/8	4 1/2	4 5/8	4 5/8
No. 2 Amber	4 3/4	4 3/4	4 7/8	4 5/8	4 5/8	4 5/8	4 1/2	4 1/2	4 1/2	4 7/8	4 7/8	4 7/8	4 1/2	4 5/8	4 7/8	4 5/8	4 5/8	4 5/8	...	4 5/8	4 11/16	4 5/8	4 3/4	4 3/4
No. 3 Amber	4 5/8	4 5/8	4 3/4	4 1/2	4 1/2	4 1/2	4 1/2	4 3/8	4 3/8	4 1/2	4 7/16	4 7/16	4 3/8	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	...	4 1/2	4 5/8	4 1/2	4 5/8	4 5/8
No. 4 Amber	4 1/2	4 1/2	4 5/8	4 3/8	4 3/8	4 3/8	4 1/4	4 1/4	4 1/4	4 3/8	4 3/8	4 3/8	4 1/4	4 7/16	4 3/8	4 3/8	4 3/8	4 3/8	...	4 3/8	4 1/2	4 3/8	4 7/16	4 1/2
Rolled Brown	4 3/8	4 1/4	4 3/8	4 1/4	4 1/4	4 1/8	4 1/8	4 1/16	4	4 1/8	4	4	4	4 1/16	4 1/8	4 1/16	4 1/16	4 1/8	...	4 1/8	4 1/8	4	4 1/8	4 1/4

*Holiday.

dustry, we believe that the statistics gathered by many authorities do not correctly reveal the existing situation. Rubber figures lend themselves very easily to duplication, much more so than the figures of other industries. We are under the impression that world's rubber stocks for some time now have been stationary. We believe that even a slight rise in the living cost in the Far East will have an adverse influence on the output by natives, whose earnings derived from rubber now barely furnish their necessities of life. The fact that the pound sterling is no longer on a gold basis will make competition increasingly more difficult for Dutch producers. We further think that the production schedules of British as well as Dutch plantation companies will be very sharply revised downwards as of the first of the year. We look for many more plantations to go on a 'care and maintenance' basis, and one reason for this belief is that the number of contracts on the books of plantation companies for shipment during 1932 is very slight.

"As regards absorption, we see no improvement in the domestic rubber consumption between now and the end of the year. We expect September consumption to be in the neighborhood of 25,000 tons [it was 23,638 tons] and probably slightly below that figure for the remaining 3 months of this year. However, we look rather confidently to the disappearance of overproduction after the turn of the year."

Prices at the close of October 17 on No. 1 Standard contract were:

Position	High	Low	Close	Previous Close
Oct.	....	....	4.95	4.95
Nov.	....	....	4.98	4.98
Dec.	....	....	5.00/5.02	5.00/5.05
Jan.	....	....	5.07	5.07
Feb.	....	....	5.14	5.14
Mar.	5.22	5.20	5.20	5.20
Apr.	....	....	5.28	5.29
May	5.40	5.40	5.36	5.38
June	....	....	5.43	5.44
July	5.54	5.48	5.50	5.50
Aug.	....	....	5.56	5.57
Sept.	5.67	5.67	5.63/5.68	5.65/5.69
Spot	....	....	5.00	5.00

Week ended October 24. The market reached the highest levels in some time when a movement carried over from the previous week sent all prices over 5 cents, with spot rubber selling at 5.20 cents, and September futures up to 5.87 cents. But developments later in the week erased the gain, and the market closed about unchanged from the previous week.

One of the chief factors responsible for the turn of prices was an indication that shipments were increasing from Malaya, even though temporarily. The Malayan Census report for September showed that rubber production on estates smaller than 100 acres in size, totaled 16,593 tons compared with 15,106 tons during August. The output of estates over 100 acres in size was 20,240 tons compared with 20,941 tons during the previous month.

Estate stocks at the end of the month totaled 22,036 tons against 23,855 tons at the end of August, while an even more substantial shrinkage was shown by dealers' holdings during the month, which amounted to 18,248 tons against 20,126 tons last August.

In a bulletin issued by the Department of Commerce, the following information is given: "A radiogram from Acting Trade Commissioner Smith, Singapore, states that by a decision of October 19, the conference rate to contract shippers of rubber from Singapore to New York is temporarily reduced from $11.50 to $5.50 per ton. It is expected in Singapore that this rate may prevail until about November 5, 1931. The reduction was caused by action of an im-

New York Quotations

Following are New York outside market rubber quotations for one year ago, one month ago, and October 26, the current date

Plantation Hevea	October 25, 1930	September 26, 1931	October 26, 1931
Rubber latex (Hevea) .gal.	$0.75 @$0.90	$0.75 @	$0.69 @
Sheet			
Ribbed, smoked, spot....*lb.*	.08⅞@	.04⅞@.05	.04 11/16@.04¾
October	.08⅞@	.05 @	.04¾@
November-December	.09 @.09⅛	.05⅛@	.04¾@
January-March	.09¾@	.05⅛@.05¼	.04⅞@
April-June	.09⅝@	.05¼@.05⅜	.05 @.05 1/16
CREPE			
No. 1 Thin latex (first latex) spot	.09¼@.09⅜	.05⅜@.05½	.05⅛@.05¼
October	.09⅛@	.05½@	.05¼@
November-December	.09½@	.05⅝@	.05¼@
January-March	.09¾@.09⅞	.05⅝@.05¾	.05 1/16@.05⅜
April-June	.10⅛@	.05¾@.05⅞	.05⅜@.05½
No. 2 Amber, spot ("B" blanket)	.08 @	.04⅝@.04¾	.04½@.04⅝
October	.08 @	.04¾@	.04⅝@
November-December	.08¼@	.04⅞@	.04⅝@
January-March	.08⅜@	.04⅞@.05	.04⅝@.04⅞
April-June	.08½@	.05 @.05⅛	.04¾@.05
No. 3 Amber, spot ("C" blanket)	.07¾@	.04½@.04⅝	.04⅜@.04½
No. 1 Brown, clean, light, thin	.07⅞@.08	.04⅝@.04¾	.04 11/16@
No. 2 Brown, clean, thin	.07⅝@.07¾	.04½@.04⅝	.04⅝@
Brown, roll	.07½@	.04⅛@.04⅜	.04 @.04⅛
East Indian			
PONTIANAK			
Bandjermasin	.07 @	.07 @	.06 @
Pressed block	.12 @	.09½@	.09 @
Sarawak	.07 @	.07 @	.06 @
South American			
PARAS			
Upriver, fine	.12¼@	.05¾@	.05¾@
Upriver, fine	*.15 @	*.10 @	*.09½@
Upriver, coarse	.08 @	.05 @	†.04½@
Upriver, coarse	*.10½@	*.05½@	*.05¼@

South American	October 25, 1930	September 26, 1931	October 26, 1931
PARAS—*Continued*			
Islands, fine *lb.*	$0.11¼@	$0.05½@	†$0.05 @
Islands, fine	*.14½@	*.09¾@	*.09 @
Acre, Bolivian, fine	.12½@	.06¼@	.05⅞@
Acre, Bolivian, fine	*.15 @	*.10¼@	*.10 @
Beni, Bolivian	.12¾@	.06½@	.06 @
Madeira, fine	.12¼@	.05⅞@	.05¾@
CAUCHO			
Upper caucho ball	.07¾@	.04½@	†.04 @
Upper caucho ball	*.10½@	*.05½@	*.05¼@
Lower caucho ball	.07¼@	.04 @	†.03 @
Manicobas			
Ceará, negro heads	@	@	@
Ceará scrap	@	@	@
Manicoba, 30% guaranteed	@	†.04 @	†.04 @
Mangabiera, thin sheet	@	†.04 @	†.04 @
Guayule			
Duro, washed and dried	.15 @	.14 @	.13 @
Ampar	.16 @	.15 @	.14 @
Gutta Percha			
Gutta Siak	.12½@	.10¾@	.10½@
Gutta Soh	.25 @	.20 @	.18 @
Red Macassar	1.75 @	2.00 @	2.00 @
Balata			
Block, Ciudad Bolivar	.34 @	.26 @	.23 @
Colombia	.34 @	@	@
Manaos block	.38 @	.26 @	.23 @
Surinam sheet	.58 @	.50 @	.45 @
Amber	.63 @	.52 @	.50 @

*Washed and dried crepe. Shipment from Brazil.
†Nominal.

New York Outside Market (Continued)

	October, 1931					
	19	20	21	22	23	24
Ribbed Smoked Sheet	5 1/16	5 1/16	5⅛	5	4 13/16	4 13/16
No. 1 Thin Latex Crepe	5½	5 1/16	5½	5⅜	5¼	5⅛
No. 1 Thick Latex Crepe	5 1/16	5⅜	5¼	5¼	5⅛	5
No. 1 Brown Crepe	4 13/16	4⅞	4⅞	4 13/16	4¾	4⅝
No. 2 Brown Crepe	4¾	4¾	4 13/16	4¾	4 11/16	4⅝
No. 2 Amber	4 13/16	4⅞	4⅞	4 13/16	4¾	4⅝
No. 3 Amber	4¾	4¾	4 13/16	4¾	4 11/16	4⅝
No. 4 Amber	4⅝	4⅝	4 11/16	4⅝	4⅝	4⅜
Rolled Brown	4⅝	4⅜	4¼	4¼	4¼	4⅛

Low and High New York Spot Prices

Plantations	1931*	October 1930	1929
Thin latex crepe	$0.05 @$0.05 1/16	$0.07⅝@$0.09⅜	$0.19¼@$0.21⅜
Smoked sheet, ribbed	.04⅝@ .05 1/16	.07⅜@ .09	.18¼@ .20⅜
Paras			
Upriver fine	.06 @ ...	.12 @ .12¼	.19½@ .20½
Upriver coarse	Nominal	.06½@ .07¼	.10½@ .11
Upper caucho ball	.03 @ ...	.06 @ .07¼	.10½@ .11

*Figured to October 26, 1931.

portant Singapore rubber merchant who has apparently chartered a vessel at a special rate lower than the conference regular rate, and whose ship is expected to sail about November 5. Singapore circles anticipate heavily increased exports, temporarily, by traders taking advantage of the special low rate."

At the annual meeting of the Rubber Exchange of New York, Inc., the three principal officers were reelected: John L. Julian, president; William A. Overton, vice president; and J. Chester Cuppia, treasurer. The Board of Governors follows: Robert Badenhop, Frank D. Pressinger, Marcus Rothschild, Samuel Swerling, Harry A. Astlett, Harold L. Bache, William E. Bruyn, James T. Bryan, Charles Slaughter, Charles T. Wilson and Edward J. Wade.

Prices at the close of October 24 on the No. 1 Standard contract were:

Position	High	Low	Close	Previous Close
Oct.	....	....	4.70	4.92
Nov.	....	....	4.72	4.94
Dec.	....	....	4.75/4.80	4.96/5.00
Jan.	....	....	4.82	5.02
Feb.	....	....	4.89	5.08
Mar.	5.10	4.95	4.97	5.15
Apr.	....	....	5.05	5.20
May	5.15	5.15	5.13/5.16	5.26
June	....	....	5.17	5.33
July	5.33	5.24	5.22	5.41
Aug.	....	....	5.28	5.49
Sept.	5.50	5.50	5.35/5.40	5.57
Spot	....	....	4.75	4.96

Reported failure of a plan to effect restriction of plantation output caused a further decline in the price of rubber. October delivery of A contracts changed hands at 4.30 cents a pound. This was a decline of 30 points. Total contracts for the day amounted to 80 tons.

Price Differentials

Price differentials between the various grades of Hevea plantation rubber which shall prevail on all deliveries against old "A" contracts, for November, 1931, follow: Off quality first latex crepe at one-tenth of a cent (.1c.) per pound; good f. a. q. ribbed smoked sheets at two-tenths of a cent (.2c.) per pound; ordinary f. a. q. ribbed smoked sheets at thirty-five one-hundredths of a cent (.35c.) per pound.

N. Y. Outside Market

With sales of only 118,000 automobiles in September the automobile industry has curtailed production correspondingly, with the result that several factories have shut down, and buyers are not active in the market.

Tire output is far below last year's figures, and prospects are that demand will not improve for the next 2 or 3 months at least. Both these industries, however, have cut down stocks on hand so that when the demand comes, it will mean that they will have to hustle to fill orders. In the tire industry, particularly, opinion seems to be that the manufacturers have leaned backwards in their efforts to clear shelves of surplus stock. Stocks on hand on September 1 were 18 per cent less than they were on September 1, 1930.

Output of crude rubber has not flagged in the least. In fact with new freight rates at about half the former rate, shipments from the Far East will probably increase in the next month or so. Consumption, on the other hand, is at a low ebb.

The trouble in the rubber industry is the same as that in a good many others at the present time. People are waiting to see what will happen. They are waiting to see if President Hoover's plan for a $500,000,000 credit pool to release the frozen assets of the country will work; they are waiting to see if the Manchurian question will be settled amicably; they are waiting for tangible results from the Hoover-Laval and Hoover-Grandi conferences. But meanwhile they are holding on to their money.

If the statistics are right, hand-to-mouth buying has resulted in a large backlog of orders which, when released, will make a good many factory wheels hum again. It is a matter of confidence; and if we are to believe men like Schwab and Farrel, the turn is about to be called.

Buyers for the tire manufacturers were reported in the market on September 25, when rubber hit 4.40 cents in the old September "A" contract on the Rubber Exchange. In the actuals market business was done at from 4⅝ to 4¾ cents.

Prices at the close of September 26 were:

Spot	Sept. 26	Month Ago	Year Ago
Crepe	5 1/16	5⅝	8
Ribs	4¾	5⅛	7¾
Upriver fine	6	7¾	12¼

Week ended October 3. The drop of 900 tons in the United Kingdom stocks strengthened cables from London on Saturday, and in following the trend abroad the prices in the outside market were advanced a small fraction to 4¾ cents a pound for October-November ribs, which was at about the level prices started from in the beginning of the week.

Bids for rubber were made at 4 11/16 spot, and upriver fine paras at 6 cents spot. But outside of plantation sheet rubber, there were few other bids.

In regard to restriction, we have, as John L. Julian, president of the Exchange says, "a free, open market, with the immutable law of supply and demand fixing the price of the commodity." The large shipments are at present fixing the price, and improvement in the market must necessarily depend on an improvement in the statistical position.

Prices at the close of October 3 were:

Spot	Oct. 3	Month Ago	Year Ago
Crepe	5 1/16	5½	8⅜
Ribs	4 1/16	5	8⅛
Upriver fine	6	7⅛	12

Week ended October 10. The confidence inspired by President Hoover's effort to liquefy the assets of the sound banks of the country, and the prompt way in which prominent bankers acted upon his plan, was reflected in the actuals market with firmer prices. Sales, however, are of limited volume, reflecting conditions in the automobile and the tire industries.

The Rubber Manufacturers' Association released tire figures during the week which showed that production of tires for August was 3,905,933 casings, compared with 4,926,484 in July, a decrease of 20.7 per cent. In August last year production was 4,165,611 units, a decline of 6.2 per cent.

Shipments of tires during August at 4,959,984 units showed a decline of 9.2 per cent from the July shipments of 5,461,908 casings. Last August shipments were 5,174,875 tires, or 4.2 per cent greater than this year.

The stocks of tires on hand August 31 amounted to 8,896,296, compared with 9,919,456 on hand July 31. The decline was 10.3 per cent. Stocks of tires on hand August 31, 1930, totaled 10,847,705, or 18.0 per cent greater than this year.

Stocks of rubber in the hands of dealers in the Far East at the end of September amounted to 24,484 tons of ribbed smoked sheets, 11,383 tons of crepe, 1,831 tons of unsmoked sheets, and 1,670 tons of scrap and lump rubber, or a total of 39,368 tons. This total compared with 42,383 tons at the end of August, and 36,618 at the end of September in 1930.

Automobile output is still on the decline because of further curtailment by 2 large manufacturers of low-priced cars and a cut in schedule by the third largest producer, according to the *Times* index.

The report also says, "With sales difficulties normally increased at this time of year by a general disposition to wait for new models, this year sales efforts are meeting intensified resistance as a result of recent financial developments which have served to advertise and accentuate the depression."

Prices at the close of October 10 were:

Spot	Oct. 10	Month Ago	Year Ago
Crepe	5¼	5⅝	8⅛
Ribs	4⅞	5⅛	7⅞
Upriver fine	6	7⅛	12

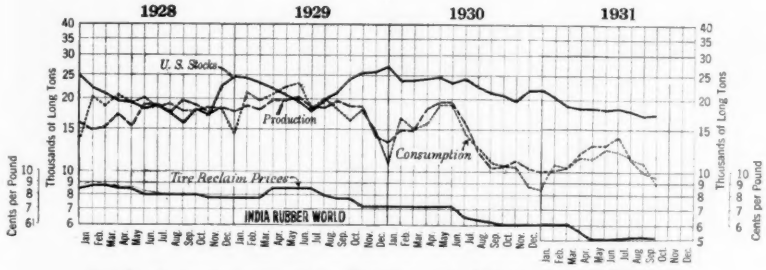
Week ended October 17. Factory interest was scattered in an extremely quiet market. The nearby positions were quoted at 5⅛ cents, with factory representatives buying only what was necessary. United Kingdom stocks on October 10 were 134,253 tons, against 119,469 tons a year ago.

An interesting bulletin from the Department of Commerce comments on the effect of the depreciation of British currency on rubber in part as follows:

"If one assumes that sterling will remain below gold parity for some time, the international trade in tires might be affected to some extent. In a country with depreciating currency, wages and fixed costs do not rise so rapidly as the currency depreciates. After a point of stability is reached, in other words when the currency is depreciated instead of depreciating, these costs tend to catch up with the depreciation and sometimes even exceed it. In a country dependent on imports for foodstuffs and raw materials, the lag would normally be less than in a country supplying its own food and raw materials. Nevertheless, a temporary period of advantage to British exporters of tires is not to be expected. This may cause the four American, one French, and one Italian company with branch tire factories in United Kingdom to supply more tires to other export markets from British factories. Other considerations would affect the decisions of the companies concerned, such as the present existence of excess capacity in their British plants, and the effect of reducing output in home factories. There might, however, be some tendency for British tire exports and rubber consumption to increase at the expense of tire exports and rubber consumption in America.

(Continued on page 110)

Reclaimed Rubber



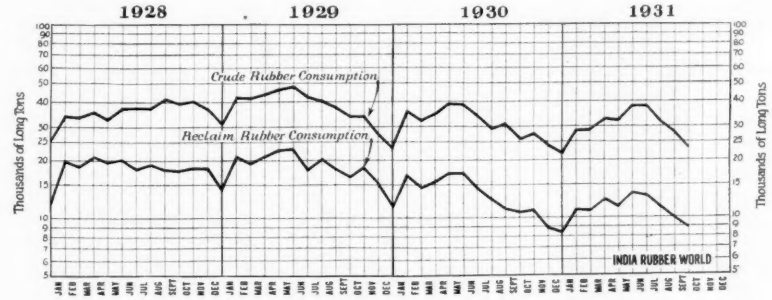
Production, Consumption, Stocks, and Price of Tire Reclaim

THE statistical record of reclaim for September shows the product as being 9,629 long tons compared with 10,110 tons for August. Reclaim consumption in September was 8,932 tons compared with 9,972 tons in August. Comparison of consumption figures of crude and reclaim rubber shows that in September the ratio of reclaim to crude consumed was 37.8 per cent, an advance of 1.7 per cent over the corresponding ratio for August.

United States stocks of reclaim for July, August, and September averaged 17,370 tons with maximum in July of 17,720 tons.

The stock for September was 17,226 tons, showing a cushion very nearly equal in tonnage to the monthly consumption of September. The current movement of trade in reclaim is principally shipments on contracts with new business in expectation for spring trade revival after the turn of the year.

The broad field for reclaim in the rubber industry is well stated in the following quoted from a recent government publication.[1]



Crude and Reclaimed Rubber Consumption

"In mechanical goods reclaimed rubber is used in large proportion; in some cases no new rubber whatever is employed. Mechanical goods include such products as gaskets, packings, belting, flooring, heels, stoppers, and hose. Some grades of electrical insulation such as that employed for the familiar 'underwriters' code wire,' are made from reclaimed rubber.

"Rubberized fabrics are frequently made with a large proportion of reclaimed rubber, though some grades of hospital sheeting are made from new rubber, and balloon and gas cell fabrics are made exclusively from new rubber.

"The manufacture of rubberized fabrics with latex has its counterpart in the use of dispersions of reclaimed rubber. These aqueous dispersions may be used not only for coating fabric or paper, but also for cementing, binding, and waterproofing purposes.

"Rubber footwear including tennis shoes, boots, and overshoes, is made with a considerable proportion of reclaimed rubber.

"Reclaimed rubber is extensively used in the hard rubber industry, and may be employed in making all but the highest grades of hard rubber or ebonite.

"In this connection fillers are an important consideration because of their effect on the electrical properties and on the polishing characteristics of hard rubber. Much use is made of reclaimed rubber having low filler content, such as that produced from inner tubes. The substitution of reclaim for new rubber in the manufacture of hard rubber has relatively less effect on the mechanical properties than in the case of soft rubber goods."

Quotations on the standard grades of reclaim are reported below. With but a single exception they are the same as reported last month. The exception is No. 2 tube, now 5 to 5½ cents as compared with 5¾ to 6 cents last month.

[1] Circular of the Bureau of Standards, No. 393.

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1925	132,930	137,105	35.6	13,203	4,571
1926	180,582	164,500	45.9	23,218	5,391
1927	189,144	178,471	47.6	24,980	8,540
1928	208,516	223,000	50.4	24,785	9,577
1929	219,057	224,253	47.9	27,464	12,721
1930	157,967	153,497	41.5	24,008	9,468
1930					
January	13,902	15,766	45.8	24,241	954
February	14,676	14,012	45.5	24,241	1,203
March	16,115	14,669	43.2	24,415	1,048
April	16,511	16,269	43.0	24,592	740
May	16,496	16,411	43.7	23,356	939
June	14,581	13,534	41.6	24,484	641
July	11,411	11,918	42.3	22,477	778
August	11,158	11,321	35.9	21,636	807
September	10,588	10,787	41.4	20,704	656
October	11,437	11,038	39.3	19,912	572
November	10,895	9,075	37.5	22,000	437
December	10,197	8,697	39.3	22,000	693
1931					
January	10,460	11,003	37.6	20,466	649
February	10,871	10,800	37.5	18,878	625
March	12,938	12,524	38.2	18,375	752
April	13,267	11,745	35.2	18,356	577
May	13,478	13,103	34.6	18,088	798
June	14,066	13,045	34.4	18,505	703
July	11,393	11,447	35.8	17,720	414
August	10,110	9,972	36.1	17,165	410
September	9,629	8,932	37.8	17,226	516

*Stocks on hand the last of the month or year.
Compiled by The Rubber Manufacturers Association, Inc.

New York Quotations

October 26, 1931

	Spec. Grav.	Price Per Pound
High Tensile		
Super-reclaim, black	1.20	$0.06¼ @ $0.06½
red	1.20	.06 @ .06¼
Auto Tire		
Black	1.21	.04¾ @ .05
Black selected tires	1.18	.05 @ .05¼
Dark gray	1.35	.05¾ @ .06
White	1.40	.06½ @ .06¾
Shoe		
Unwashed	1.60	.05½ @ .05¾
Washed	1.50	.06½ @ .06¾
Tube		
No. 1	1.00	.07 @ ...
No. 2	1.10	.05 @ .05½
Truck Tire		
Truck tire, heavy gravity	1.55	.05½ @ .05¾
Truck tire, light gravity	1.40	.05¾ @ .06
Miscellaneous		
Mechanical blends	1.60	.04 @ .04½

STANDARD for 1932

50%

MICRONEX for TIRE TREADS

BINNEY & SMITH CO.

41 EAST 42nd STREET · · NEW YORK, N.Y.

Compounding Ingredients

THE decline in rubber manufacturing activity has been continuous since last July. No marked improvement in this respect is at present in sight; therefore activity in compounding ingredients has declined in proportion. Tire production is rated at about 40 per cent of capacity and in other divisions of the industry manufacturing is seasonal and in fair volume.

ACCELERATORS. All well - established brands of accelerators are in good demand. Their importance as factors of quality and economy in vulcanization is so great that under no circumstances can the rubber goods manufacturer omit them from his compounding.

AGE RESISTERS. Age resisters are in a similar category with accelerators as to compounding importance. Their selection is properly made only on the basis of the function desired from their use: namely, retarding of oxidation, elimination of breakdown by fatigue due to flexing, or protection of surfaces against sun cracking.

CARBON BLACK. In general the demand for standard carbon black for rubber compounding was moderate to dull during October. The price was steady at 3 cents f.o.b. Texas works for carload lots. The present outlook does not indicate that the rubber trade expects to stock carbon black during the remainder of the year.

LITHARGE. At the close of September litharge in casks was quoted at 6¾ cents. Two weeks later the price dropped to 6½ cents because of the decline in pig lead. October 26 litharge fell to 6¼ cents, with the demand seasonally dull.

LITHOPONE. There is little activity in the lithopone market. The price is steady and firm at 4½ to 4¾ cents basis for carload lots.

SOFTENERS and STABILIZERS. The several staple ingredients composing this group are in the usual steady request, being essentially necessary in all compounding. Stearic acid both single and double pressed is quoted ½-cent a pound down from one month ago. Degras is in fair demand and price is steady.

SOLVENTS. Petroleum solvents quoted at 5 cents a gallon at refineries one month ago was quoted at 5¼ cents October 26 for both light and heavy grades with light demand from the rubber trade.

ZINC OXIDE. During the past month the price held steady and unchanged with seasonal interest and moderate consuming demand from manufacturers of rubber goods.

New York Quotations

October 26, 1931

Prices Not Reported Will Be Supplied on Application

Abrasives			
Marble flour	*ton*	$15.00	@
Pumice	*lb.*	.03	@
Rottenstone, domestic	*ton*	23.50	@ 28.00
Rottenstone, English	*lb.*	.03¼	@
Silica, spot, l. c. l.	*lb.*	.01	@ .01¼
Accelerators, Inorganic			
Lead, carbonate	*lb.*	.07¼	@
red	*lb.*	.07¼	@
sublimed blue	*lb.*	.06¾	@
sublimed white	*lb.*	.06¾	@
super-sublimed white	*lb.*	.06¾	@
Lime flour, hydrated	*ton*	40.00	@
Litharge, casks	*lb.*	.06¾	@
Magnesia, calcined, heavy	*lb.*	.04	@
carbonate	*lb.*	.06	@ .07
Orange mineral A.A.A.	*lb.*	.09¼	@
Accelerators, Organic			
Aldehyde ammonia	*lb.*	.65	@ .67
Altax	*lb.*		@
Barak	*lb.*		@
BLE	*lb.*		@
Butene	*lb.*		@
Captax	*lb.*		@
Crylene	*lb.*		@
paste	*lb.*		@
DBA	*lb.*		@
Di-esterex N.	*lb.*		@
DOTG	*lb.*	.42	@ .43
DPG	*lb.*	.30	@ .31
Ethylidine aniline	*lb.*	.45	@ .46
Formaldehyde aniline anhydro	*lb.*	.37½	@ .38½
Grasselerator 808	*lb.*		@
833	*lb.*		@
Heptene	*lb.*		@
base	*lb.*		@
Hexamethylenetetramine	*lb.*	.58½	@ .59½
Hydrone	*lb.*		@
Lead oleate, No. 999	*lb.*	.125	@
Witco	*lb.*	.10	@
Lithex	*lb.*		@
Methylene dianiline	*lb.*	.37½	@ .38½
Monex	*lb.*		@
Novex	*lb.*		@
Phenex	*lb.*	.65	@ .70
Plastone	*lb.*		@
R & H 40	*lb.*	.40	@ .41
50	*lb.*	.40	@ .41
50-D	*lb.*	.40	@ .41
397	*lb.*	.75	@ .76
Retardex	*lb.*	.35	@ .40
Safex	*lb.*		@
SPDX	*lb.*	.70	@ .75
Super-sulphur No. 1	*lb.*		@
No. 2	*lb.*		@
Tensilac 39	*lb.*	.40	@ .42½
Thermlo F	*lb.*		@
Thiocarbanilid	*lb.*	.20	@ .22
TMTT	*lb.*	3.00	@ 3.25
Trimene	*lb.*		@
base	*lb.*		@
Triphenyl guanidine	*lb.*	.58	@ .60
Tuads	*lb.*		@
Ulto	*lb.*	3.00	@
ZBX	*lb.*		@
Zimate	*lb.*		@
Acids			
Acetic 28% (bbls.)	*100 lbs.*	2.50	@ 2.65
glacial (carboys)	*100 lbs.*	8.85	@ 9.10
Sulphuric, 66°	*ton*	$15.50	@
Age Resisters			
Age-Rite Gel	*lb.*		@
powder	*lb.*		@
resin	*lb.*		@
white	*lb.*		@
Albasan	*lb.*		@
Antox	*lb.*		@
Stabilite	*lb.*	.57	@ .62
Alba	*lb.*	.70	@ .75
VGB	*lb.*		@
Zalba	*lb.*		@
Alkalies			
Caustic soda, 76% solid	*100 lbs.*	3.44	@ 3.59
Antisun Materials			
Heliozone	*lb.*		@
Sunproof	*lb.*		@
Binders, Fibrous			
Cotton flock, dark	*lb.*	.08½	@ .10
dyed	*lb.*	.50	@ .85
white	*lb.*	.11	@ .16
Colors			
BLACK			
Bone, powdered	*lb.*	.05½	@ .15
Carbon (see Reenforcers)			
Drop (bbls.)	*lb.*	.05½	@ .17
Lampblack (commercial)	*lb.*	.07	@ .08
BLUE			
Blue toners	*lb.*	.60	@ 3.85
Brilliant blue	*lb.*	3.50	@
Prussian	*lb.*	.35	@ .37
Ultramarine	*lb.*	.06	@ .30
BROWN			
Iron oxide	*lb.*		@
Mapico	*lb.*	.17	@
Sienna, Italian, raw	*lb.*	.04½	@ .11
GREEN			
Brilliant green	*lb.*	3.50	@
Chrome, light	*lb.*	.23	@ .25½
medium	*lb.*	.26	@ .27½
Chromium oxide	*lb.*	.25	@ .32
Dark green	*lb.*	1.30	@
Green toners	*lb.*	1.00	@ 3.60
Light green	*lb.*	.70	@
ORANGE			
Cadmium sulphide	*lb.*	.65	@ .75
Orange lake	*lb.*	.50	@
Orange toners	*lb.*	1.60	@
ORCHID			
Orchid toners	*lb.*	1.05	@ 1.75
PINK			
Pink toners	*lb.*	1.00	@ 1.80
PURPLE			
Permanent purple	*lb.*	1.80	@
Purple toners	*lb.*	.60	@ 1.90
RED			
Antimony			
Crimson, R. M. P. No. 3	*lb.*	.48	@
Sulphur free	*lb.*	.52	@
7-A	*lb.*	.35	@
Z-2	*lb.*	.22	@
Cadmium	*lb.*		@
Chinese red	*lb.*	.85	@
Crimson red	*lb.*	.85	@
Iron Oxides			
bright pure domestic	*lb.*	.09	@ .12
bright reduced domestic	*lb.*	.03	@ .08
Indian (maroon), pure domestic	*lb.*	.09¼	@ .12
Indian (maroon), reduced domestic	*lb.*	$0.03	@$0.08
Softex	*lb.*	.08¾	@
Mapico	*lb.*	.09	@
Medium red	*lb.*	.85	@
Oxinony	*lb.*		@
Red toners	*lb.*	.95	@ 2.75
Rub-er-red	*lb.*	.08¾	@
Scarlet red	*lb.*	1.50	@
Spanish red oxide	*lb.*	.03½	@ .07
Venetian red (bbls.)	*lb.*	.01½	@ .05
WHITE			
Lithopone	*lb.*	.04½	@ .04¾
Albalith	*lb.*	.04½	@ .05
Azolith	*lb.*	.04½	@ .05
Cryptone	*lb.*	.06½	@ .07
Grasselli (50 lb. bags)	*lb.*	.04½	@ .04¾
(400 lb. bbls.)	*lb.*	.04¾	@ .05
Titanium oxide, pure	*lb.*	.20	@
Titanox "B"	*lb.*	.06½	@ .07
"C"	*lb.*	.07	@ .07½
Zinc Oxide			
AAA (lead free)	*lb.*	.06½	@ .07
Azo (factory):			
ZZZ (lead free)	*lb.*	.06½	@ .07
ZZ (leaded)	*lb.*	.06¼	@ .06¾
Z (8% leaded)	*lb.*	.06¼	@ .06¾
Black label (lead free)	*lb.*	.06½	@
Green label (lead free)	*lb.*	.06½	@
Green seal	*lb.*	.10⅜	@ .10¾
Green seal, Anaconda	*lb.*	.10⅜	@ .10⅞
Kadox, black label	*lb.*	.10⅜	@ .10⅞
blue label	*lb.*	.09⅜	@ .09⅞
red label	*lb.*	.08	@ .08½
Red label (lead free)	*lb.*	.06½	@
Red seal	*lb.*	.09⅜	@ .09⅞
Red seal, Anaconda	*lb.*	.09⅜	@ .09⅞
Special	*lb.*	.07	@ .07½
White seal (bbls.)	*lb.*	.11⅝	@ .11⅞
White seal, Anaconda	*lb.*	.11⅝	@ .11⅞
XX green	*lb.*	.07	@ .07½
XX red	*lb.*	.06½	@ .07
Zinc sulphides (bbls.)	*lb.*	.15	@ .15¼
YELLOW			
Cadmium sulphide	*lb.*	.65	@ .75
Chrome	*lb.*	.20	@
Lemon yellow	*lb.*	1.50	@
Mapico	*lb.*	.12	@
Ochre, domestic	*lb.*	.01⅜	@ .02⅛
Yellow toners	*lb.*	2.50	@
Deodorant			
Rodo	*lb.*		
Factice—See Rubber Substitutes			
Fillers, Inert			
Asbestine	*ton*	13.40	@13.50
Barytes, white, spot	*ton*	33.00	@
off color, spot	*ton*	25.00	@
Foam "A" (f.o.b. St. Louis)	*ton*	23.00	@
Basofor	*lb.*		@
Blanc fixe, dry	*lb.*	.04½	@
pulp	*ton*	42.50	@45.00
Infusorial earth	*ton*	40.00	@80.00
Kieselguhr	*lb.*	.03½	@
Suprex white, extra light	*ton*	70.00	@80.00
Tripoli	*lb.*	.02	@
Whiting			@
Chalk, imported	*100 lbs.*	1.35	@

New York Quotations

October 26, 1931

Prices Not Reported Will Be Supplied on Application

Domestic .....100 lbs.	$1.00	@	
Paris white, English cliffstone .....100 lbs.	1.40	@	
Quaker .....ton		@	
Sussex .....ton		@	
Witco (l. c. l.) (f.o.b. New York)..ton	20.00	@	
Fillers for Pliability			
Flex .....lb.		@	
Fumonex .....lb.	.02½	@	.06
P-33 .....lb.		@	
Thermax .....lb.		@	
Velvetex .....lb.	.02	@	.05
Finishes			
Mica, amber .....lb.	.04½	@	
Shellac, fine orange.....lb.	.30	@	
Starch, corn, pwd...100 lbs.	2.57	@	2.77
potato .....lb.	.05½	@	.06
Talc, domestic .....lb.	.01¼	@	
dusting .....lb.	.01¼	@	
French .....ton	18.00	@	22.00
Italian .....lb.	.02½	@	.03
Pyrax A .....ton		@	
Inflating Material			
Ammonium carb., pwd...lb.	.10¼	@	
lump .....lb.	.10	@	
Sponge paste .....lb.	.30	@	
Mineral Rubber			
Fluxrite (solid) .....lb.		@	
Genasco (fact'y) .....ton	40.00	@	42.00
Gilsonite (fact'y) .....ton	37.14	@	39.65
Granulated M. R.....ton		@	
Hydrocarbon, hard .....ton		@	
Paradura (fact'y) .....ton	62.50	@	65.00
Parmr Grade 1.....ton	23.00	@	28.00
Grade 2 .....ton	23.00	@	28.00
Robertson, M. R., solid (fact'y) .....ton	32.00	@	80.00
M. R. granulated.....ton	35.00	@	80.00
Mold Lubricants			
Sericite .....lb.		@	
Soapbark (cut) .....lb.	.07½	@	.08
Soapstone .....lb.	.01	@	
Oils			
Castor .....lb.	.12½	@	
Kerosene .....gal.	.09	@	
Mineral .....gal.	.20	@	
Poppy seed oil .....gal.	1.70	@	
Rapeseed, blown .....gal.	.68	@	.70
Red oil, distilled.....lb.	.07¾	@	.07⅞
Rubber process .....gal.	.25	@	
Spindle .....gal.	.30	@	
Protective Colloids			
Bentonite (dispersion clay).lb.	.02	@	.02½
Casein, domestic .....lb.	.06½	@	.07½
Reenforcers			
Aluminum flake (sacks, c. l.) .....ton	21.85	@	
(sacks, l.c.l.) .....ton	24.50	@	
Carbon Black			
Aerfloted arrow .....lb.	$0.03½	@	.07
Cabot's certified black..lb.	.03	@	
Century (works, La., c. l.) .....100 lbs.	3.00	@	
Disperso (works, La., c. l.) .....100 lbs.	3.00	@	
Dixie brand .....lb.	.03½	@	.07½
Elastex .....lb.	.03	@	.07
Excello .....lb.	.03½	@	
Gastex (f. o. b. fact'y) contracts .....lb.	.02½	@	
carload .....lb.	.02½	@	
less carload .....lb.	.03¾	@	.04¼
Kosmos brand .....lb.	.03½	@	.07½
Micronex .....lb.	.03½	@	.07½
Ordinary (compressed or uncompressed) .....lb.	.03	@	.07
Supreme .....lb.	.03	@	
Clays			
Bento .....lb.		@	
Blue Ridge, dark.....ton		@	
China .....lb.	.01¼	@	
Dixie .....ton		@	
Dusto .....lb.		@	
Langford .....ton		@	
Lexo (works) .....ton		@	
Par .....ton		@	
Perfection .....ton	20.00	@	
Suprex No. 1.....ton	8.00	@	
No. 2, dark.....ton	6.50	@	
Glue, high grade.....lb.	.20	@	.25
Rubber Substitutes or Factice			
Amberex .....lb.	.15	@	
Black .....lb.	.07	@	.11
Brown .....lb.	.07	@	.12
White .....lb.	.08	@	.15
Softeners			
Burgundy pitch.....100 lbs.	6.00	@	
Atlas .....100 lbs.	6.50	@	
Corn oil, crude .....lb.	.05½	@	.05¾
Cottonseed oil (P. S. Y.).lb.		@	
Degras .....lb.	.03½	@	.04½
Fluxol .....ton	18.00	@	80.00
Fluxrite (fluid) .....lb.		@	
Palm oil (Lagos) .....lb.	.04⅞	@	
(Niger) .....lb.	.04	@	
(Witco) .....lb.	.07½	@	
Para-flux .....gal.	.15	@	.17
Petrolatum, snow white..lb.	.07	@	.07½
Pine oil, steam distilled.gal.	.61	@	
Pine pitch .....bbl.	5.75	@	6.25
Pine tar .....gal.	.19	@	.22
Rosin K (280 lbs.).....bbl.	4.00	@	
Rosin oil, compounded...gal.	.35	@	
No. 3, deodorized.....gal.	.57	@	
No. 556, deodorized....gal.	.48	@	
Rubberseed, drums .....lb.	.09	@	.09½
Rubtack .....lb.	.10	@	
Tonox .....lb.		@	
Witco No. 20.....gal.	.08	@	
Solvents			
Benzol (90% drums)....gal.	$0.25	@	
Carbon bisulphide (drums).lb.	.05½	@	.12
tetrachloride .....lb.	.06½	@	.07
Dip-Sol .....gal.		@	
Dryolene, No. 9 .....gal.		@	
Gasoline			
No. 303			
Drums, (c. l.).....gal.		@	
Tank cars .....gal.	.10	@	
Petrobenzol .....gal.		@	
Rub-Sol .....gal.		@	
Solvent naphtha (tanks) .gal.	.26	@	
Stod-Sol .....gal.		@	
Trolucil .....gal.		@	
Turpentine, Venice.....lb.	.20	@	
dest distilled .....gal.	.33	@	.36
Stabilizers			
Laurex, ton lots.....lb.		@	
Stearates			
Aluminum .....lb.		@	
Calcium .....lb.		@	
Magnesium .....lb.		@	
Zinc .....lb.		@	
Stearex B .....lb.	.08	@	.12
Stearex flake .....lb.	.09	@	.13
Stearic acid, dbl. pres'd..lb.	.08	@	.08½
Zinc laurate .....lb.	.13½	@	
Stearate .....lb.	.20	@	
Vulcanizing Ingredients*			
Sulphur			
Rubber sulphur 99½% superfine (c.l.)..100 lbs.	2.20	@	2.55
(l.c.l.) .....100 lbs.	2.60	@	3.10
Soft rubber, 100% (c.l.) .....100 lbs.	2.60	@	2.95
(l.c.l.) .....100 lbs.	2.95	@	3.50
Sulphur chloride .....lb.	.03½	@	.04
Superfine commercial flour (bbls.) .....100 lbs.	2.55	@	3.10
(bags) .....100 lbs.	2.20	@	2.80
Velvet flour (240 lb. bbls.) .....100 lbs.	2.95	@	3.50
(150 lb. bags)..100 lbs.	2.60	@	3.15
Telloy .....lb.		@	
Vandex .....lb.		@	
(See also Colors—Antimony)			
Waxes			
Beeswax, white, com.....lb.	.55	@	
carnauba .....lb.	.33	@	
ceresin, white .....lb.	.12½	@	
montan .....lb.	.06½	@	
ozokerite, black .....lb.	.28	@	
green .....lb.	.28	@	
Paraffin			
122/124 crude, white scale .....lb.	.019	@	
124/126 crude, white scale .....lb.	.019	@	
125/127 fully refined...lb.	.03	@	.03½

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for September, 1931:

Rubber Exports

Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham

To	September, 1931 Sheet and Crepe Rubber Tons	Latex Concentrated Latex and Revertex Tons
United Kingdom	5,204	36
United States	29,476	44
Continent of Europe	4,334	70
British possessions	602	1
Japan	3,791	4
Other countries	774	..
Totals	44,181	155

Rubber Imports

Actual Imports by Land and Sea

From	September, 1931 Dry Rubber Tons	Wet Rubber Tons
Sumatra	513	3,742
Dutch Borneo	380	2,243
Java and other Dutch Islands	31	17
Sarawak	693	8
British Borneo	183	15
Burma	25	2
Siam	114	104
French Indo China	221	23
Other countries	50	5
Totals	2,210	6,159

World Rubber Absorption—Net Imports

Long Tons

	Calendar Years 1929	1930	1931 June	July	Aug.
CONSUMPTION					
United States	472,000	376,107	38,249	32,217	27,828
United Kingdom	72,023	74,760	8,957	6,262	4,192
NET IMPORTS					
Australia	15,886	5,354	1,112	627	283
Austria	3,324	2,365	143	322	.....
Belgium	9,445	10,740	1,058	1,507	955
Canada	35,453	28,793	2,112	2,592	2,304
Czechoslovakia	4,650	4,532	607	1,074	.....
Denmark	799	1,147	61	69	.....
Finland	976	1,262	49	78	21
France	59,342	68,503	4,002	3,301	3,393
Germany	49,078	45,488	3,504	3,226	2,889
Italy	17,169	18,570	1,459	809	812
Japan	34,284	32,731	2,988	3,065	3,780
Netherlands	3,022	2,924	272	41	‡57
Norway	813	1,143	*50	64	46
Russia	12,626	16,229	3,279	3,141	3,137
Spain	2,400	2,400	207	145	160
Sweden	3,857	4,414	385	218	195
Switzerland	653	808	53	63	57
Others estimated†	7,000	7,200	*600	*600	*600
Totals	804,800	705,470	69,147	59,421	.....
Minus United States (Cons.)	472,000	376,107	38,249	32,217	27,828
Total foreign	332,800	329,363	30,898	27,204	.....

* Estimate to complete table. † Includes Argentina, Brazil, Chile, China, Cuba, Egypt, Estonia, Hungary, Latvia, Mexico, Poland, Portugal, and Union of South Africa.

‡Indicating excess of reexports over imports.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

AUGUSTUS W. BANCROFT

Cotton and Fabrics

AFTER setting new low records for 8 successive days in the early part of the month, the cotton market turned about and climbed sharply to levels that added more than $50,000,000 to the value of the crop. The reason for the reversal in trend was the proposal to withhold 7,000,000 bales of cotton from the market through the cooperation of Southern bankers with the Federal Farm Board.

The bankers were to finance 3,500,000 bales of the crop by "lending, renewing, or otherwise carrying such cotton as collateral." Depending on the success of this plan, the Federal Farm Board promised to "extend the obligations of the American Cotton Cooperative Association covering approximately 2,000,000 bales of cotton of the season 1930-1931 or earlier years, to July 31, 1932." The Cotton Stabilization Corp., furthermore, was to hold the 1,300,000 bales now under its control, and the Farm Board will carry its commitments for an additional year if the acreage reduction programs now being proposed in the South are successful.

Such a plan, obviously, is necessary. With a crop estimated to be the second largest in history and with consumption below the normal average, relief would be a long time coming to the cotton farmers if no effort like that proposed were attempted. The underlying statistical position has not changed much, but the confidence inspired by this plan was sufficient to reverse the trend of the market.

The cotton cloth industry is in good condition, with larger orders coming from China as a result of the Manchurian dispute. Production and consumption in September was on the bullish side, and the fact that stocks of cloth on hand have decreased so drastically from last year points to the possibility of greatly increased activity should greater confidence stimulate buying.

Cotton prices covered a wide range in their up and down movements during the week ended September 26, but the net change was negligible.

The Texas legislature passed a bill, later signed by the governor, restricting next year's cotton acreage by 50 per cent. In South Carolina the legislature passed a bill altogether restricting cotton planting for next year, and it was sent to the governor for his signature.

Prices at the close of September 26 were:

Position	High	Low	Close	Previous Close
Oct.	6.16	6.02	6.05/06	6.14/15
Dec.	6.35	6.24	6.25/26	6.33/34
Jan.	6.43	6.36	6.36	6.44
Mar.	6.64	6.54	6.54/56	6.62/63
May	6.83	6.71	6.73/74	6.80
July	7.01	6.87	6.87/89	6.97/98

Week ended October 3. For the first time since 1899 cotton broke below 6 cents in the last week. The decline started on Monday when October contracts sold at 5.95 cents, but the decline continued on every one of the succeeding days of the week, and with a drop of 12 to 14 points on Saturday, the October contract sold at 5.43 cents; and May, June, and July were the only futures still selling over 6 cents.

The cause of the 9 straight drops in price and the six straight lows was the heavy southern selling and the increasingly heavy supplies flowing to the markets. Transactions at southern markets in the past few days have been far greater than they were last year, and hedge selling offsets trade buying.

The extreme weakness of the stock market in the last 6 days has not helped the cotton market. Then the upward course of the market in Liverpool a week ago was reversed; on Wednesday prices were 100 English points below the highs of the previous week.

The weather has been generally favorable for gathering the crop, and recent private estimates are close to the government's last figures. It is also reported that the condition of the crop is surprisingly good considering that fertilizer sales were approximately 35 per cent less than they were last year.

Cotton cloth production has equaled the seasonal trend, with the *Times'* index standing at 88.0 for the week ended September 26 compared with 88.1 for the preceding week and 72.1 for the corresponding week last year.

The New York Cotton Exchange Service reported that consumption of Indian cotton last season was 6,076,000 running 400-pound bales compared with 6,564,000 in the previous season and 5,564,000 two seasons ago—and with 4,807,000 in the depression year 1920-21, or 25 per cent less than in the present depression year.

Prices at the close of October 3 were:

Position	High	Low	Close	Previous Close
Oct.	5.58	5.43	5.43	5.57/58
Dec.	5.73	5.61	5.61/62	5.73
Jan.	5.85	5.71	5.72/73	5.84/85
Mar.	6.02	5.89	5.90	6.02/03
May	6.21	6.08	6.08	6.21/22
July	6.38	6.25	6.26/27	6.38/40

Week ended October 10. The second largest crop in history was indicated by the October 1 report of the Department of Agriculture. The 1931-1932 crop was estimated at 16,284,000 bales, or 599,000 bales larger than the September 1 forecast. The only other crop that was larger was in 1926, when the harvest was 17,977,374 bales. This total is 2,352,000 bales larger than the crop of 13,931,597 bales ginned in 1930, and 1,016,000 bales, or 6.7 per cent, above the 1925-1929 average ginning of 15,268,000 bales.

The effect on the market was not so depressing as might be expected because private reports, averaging around 16,000,000 bales, had helped to discount the report. There was liquidation on the appearance of the report, but before the day closed the market showed gains of 8 to 10 points. For the week the gains were about 40 points.

Probably the chief reason for the better tone of prices this week was the heavy trade and speculative buying, and lack of selling from the South. On Tuesday the market rose $2 a bale on trade buying and declined only a few points on the following day. Toward the end of the week there was some evidence of evening up in advance of the Columbus Day holiday, but not so much as was expected, and prices closed 10 to 15 points higher on Saturday, following a covering move.

President Hoover's attempt to mobilize the banking forces of the country to release the frozen assets of sound banks was accepted and acted upon promptly; such action probably did as much as anything else to restore some confidence and steady the tone of the principal markets.

Cotton cloth activity for the week ended October 10 rose to 92.0, compared with 88.0 for the preceding week, and 73.5 for the same week last year, according to the *Times'* index. The equanimity with which the market absorbed the crop report was taken as a good sign by those concerned.

Prices at the close of October 10 were:

Position	High	Low	Close	Previous Close
Oct.	5.79	5.61	5.79	5.65
Dec.	5.93	5.72	5.91/92	5.78/79
Jan.	6.06	5.85	6.04/05	5.89/90
Mar.	6.26	6.02	6.21/23	6.08/09
May	6.44	6.22	6.40/43	6.28
July	6.61	6.38	6.56/57	6.46/47

Week ended October 17. An accumulation of buying orders cheered the market on Tuesday after the holiday. Prices jumped from 34 to 39 points, taking all months above 6 cents, and August above 7 cents. The advance was sustained during the rest of the week with the help of favorable economic and statistical developments.

A conference in New Orleans following President Hoover's plan for releasing frozen assets resulted in an announcement that southern bankers had agreed to make or extend loans on 3,500,000 bales of cotton until July 31, 1932, and that the Federal Farm Board would continue to finance the 3,300,000 bales on which it had already advanced money. It was also proposed to withhold the 3,500,000 bales financed by

COTTON BULL POINTS

1. Southern bankers are cooperating with the Federal Farm Board in a move to withhold 7,000,000 bales of cotton from the market until July.
2. Cotton spinning industry operated at 88.1 per cent capacity in September against 81.8 per cent in August and 76.4 per cent in September last year.
3. Two large British cotton mills reopened.
4. Production of cotton cloth during September was 4.1 per cent more than in August; shipments were 102.2 per cent of production; sales were 105.7 per cent of production; stocks on hand decreased 2.4 per cent; unfilled orders increased 4.4 per cent.
5. Stocks of cotton cloth on hand have declined 47.5 per cent since June, 1930.
6. Consumption of cotton during September was 463,704 bales, against 425,819 in August and 393,390 in September last year.
7. Orders for cotton are increasing from Britain and China.
8. Exports to China and India are almost double those of last year.
9. Volume of hedge selling has been smaller than expected.

COTTON BEAR POINTS

1. The October 1 estimate of the cotton crop was 16,284,000 bales, or 599,000 bales above that on September 1, and the second largest in history.
2. The weather has generally been good, and some forecast a further increase in the November 1 estimate.
3. Ginnings have increased at a sharp rate during October.
4. World supply of cotton is estimated at 40,948,000 bales, against 36,208,000 bales last year.
5. Exports to Great Britain to October 1 were only 38,000 bales, against 184,000 in the same period last season.
6. Acreage planted to cotton in Russia is believed to be 50 per cent above that of last year, and output from other foreign countries is generally expected to be greater.

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Sept. 26	6.31
Oct. 3	5.86
Oct. 10	5.78
Oct. 17	6.30
Oct. 24	6.79

the southern banking institutions. The plan received the support of the President, and the Farm Board agreed to withhold the 3,300,000 bales it was financing, provided the bankers withheld the 3,500,000 bales they were willing to finance.

The Farm Board further stated, "If the substantial reduction from the acreage of this year, now aimed at by the several state legislative enactments, becomes effective the Federal Farm Board will continue its commitments for an additional year."

Then the Census Bureau gave its report on cotton consumption for September, which showed that 463,704 bales of lint and 63,866 of linters had been consumed in that month, compared with 425,819 and 60,729 during August this year, and 393,390 and 63,308 during September last year.

Exports for September totaled 558,192 bales of lint and 4,331 of linters, compared with 211,030 and 5,244 in August this year and 902,956 and 5,896 in September, 1930.

Cotton spindles active during September numbered 25,236,916 compared with 25,622,526 during August, 1931, and 26,066,510 during September last year.

The New York Cotton Exchange Service reported the following in reference to foreign cotton affairs: "Import business on American cotton at Liverpool is handicapped by the fluctuations in the parity and exchange, but there are indications that Liverpool will buy freely in the next few weeks. China has placed some big orders for cloth at Manchester. Higher silver and the anti-Japanese boycott have helped. Inquiry from most other outlets has been good, but Indian business is still disappointing. Business with India is hampered by the tariff of that country."

Prices at the close of October 17 were:

Position	High	Low	Close	Previous Close
Oct.	6.34	6.14	6.34	6.12
Dec.	6.44	6.24	6.41/43	6.21/22
Jan.	6.55	6.35	6.54/55	6.33/34
Mar.	6.74	6.55	6.73/74	6.53
May	6.94	6.74	6.92/94	6.72/73
July	7.14	6.94	7.10/13	6.92

Week ended October 24. Under the stimulation of several spirited advances the cotton market climbed from 30 to 45 points for the week. On Saturday the early trading sent the December contract up to within 5 points of the 7-cent level, but an increase in southern hedge selling sent the market off slightly at the close.

Trade buying was strong. On Monday it was responsible for an advance of from 24 to 30 points, and another buying spurt boosted prices 29 to 34 points on Friday. Intermittent profit-taking and hedge selling, however, canceled a part of these gains.

Two private ginning reports were issued estimating ginnings for the period from October 1 to 18 at 3,323,300 and 4,098,000 bales, respectively; and for the period prior to October 18 at 8,731,000 bales and 9,506,694 bales, respectively. These heavy estimates held the market back a bit, but hedging has not been so heavy as the ginning figures indicate they should be; so traders believe that cotton is being held by growers or others.

The cotton cloth market shows improvement, and in England 2 large mills reopened after being closed for some time. The lower value of the pound has spurred buying, and the Chinese are reported to be switching from Japanese cotton to British.

The Census Bureau reported that the cotton spinning industry operated at 88.1 per cent capacity in September compared with 81.8 per cent during August, and 76.4 per cent during September, 1930. Active spindle hours per spindle in place for September were 201 compared with 190 for August and 167 for September last year.

Prices at the close of October 24 were:

Position	High	Low	Close	Previous Close
Dec.	6.95	6.84	6.85/86	6.91/93
Jan.	7.06	6.94	6.96	7.03/04
Mar.	7.21	7.09	7.11/14	7.15/17
May	7.40	7.27	7.30	7.32/33
July	7.56	7.46	7.46/47	7.52/53

Cotton futures declined 26 to 28 points on October 26 on the active months under pressure of heavy selling. This was attributed to the heavy ginning, which set a record for recent years for the period between October 1 and 18. Spot middlings declined 25 points to 6.65 cents.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. The market receded sharply during October in keeping with world events in general. Assuming that raw material prices have touched their lowest, it is now only a matter of weeks before cotton mill fabrics will show firmer prices with even a fair demand for fabrics over the next six weeks. The reduced state of supplies now in the hands of consumers, jobbers, and mills would seem to indicate that delivery dates will soon supersede in importance the matter of price as a market feature. A slowly advancing market is expected, barring disturbing influences outside of the textile business itself.

RAINCOAT FABRICS. The raincoat business is showing some seasonal volume increase. One or two numbers are selling in fair quantities below their cost. There is practically no business in other numbers, owing, no doubt, to the lack of rain.

SHEETING. Since the middle of October the print cloth demand has been rather active, so prices advanced ⅛-cent a pound. This was followed by a broadening of inquiry to constructions that have been practically unquoted. With the strengthening of the raw cotton market that occurred in the past two weeks, business confidence has increased in the cotton industry.

TIRE FABRICS. Tire fabrics generally are inactive, prices being nominally unchanged but subject to trading. Tire manufacturers are curtailing production; consequently their demand for goods has lessened greatly.

CELANESE. Current prices for Celanese are quoted unchanged from last month. Most of the Celanese fabrics sent out for rubberizing are intended for the raincoat market, which at present is rather dull because of prevalence of fine weather.

New York Quotations

October 26, 1931

Drills

38-inch 2.00-yard	yd.	$0.09¼ @
40-inch 3.47-yard		.05 7/8 @
50-inch 1.52-yard		.12½ @
52-inch 1.90-yard		.10 @
52-inch 2.20-yard		.08⅝ @
52-inch 1.85-yard		.10¼ @

Ducks

38-inch 2.00-yd. D. F.	yd.	.09½ @
40-inch 1.45-yard S. F.		.13⅛ @
72-inch 1.05-yard D. F.		.20 @
72-inch 16.66-ounce		.21⅞ @
72-inch 17.21-ounce		.22 7/8 @

MECHANICAL

Hose and belting	lb.	.19½ @

TENNIS

52-inch 1.35-yard	yd.	.14 1/8 @

Hollands

RED SEAL

36-inch	yd.	.12½ @
40-inch		.13 @
50-inch		.19 @

GOLD SEAL

40-inch, No. 72	yd.	.15 @

Osnaburgs

40-inch 2.35-yard	yd.	$0.07⅞ @
40-inch 2.48-yard		.07½ @
40-inch 3.00-yard		.06 1/8 @
40-inch 10-oz. part waste		.08¼ @
40-inch 7-oz.		.06⅛ @
37-inch 2.42-yard		.07⅝ @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	yd.	.08½ @
Bombazine 60 x 48		.07½ @
Plaids 60 x 48		.09¼ @
Plaids 48 x 48		.08¾ @
Surface prints 64 x 60		.11¼ @
Surface prints 60 x 48		.10¼ @
Print cloth, 38½-in., 60 x 48		.03¾ @
Print cloth, 38½-in., 64 x 60		.03 @

CELANESE, dyed and finished

Permanent Moire	yd.	.90 @
Faille		.80 @
Taffeta, 84 x 60		.45 @
Taffeta, 104 x 76		.52½ @
Taffeta, 200 x 64		.80 @

SHEETINGS, 40-INCH

48 x 48, 2.50-yard	yd.	.05¾ @
48 x 48, 2.85-yard		.05⅛ @
64 x 68, 3.15-yard		.06 @
56 x 60, 3.60-yard		.05 @
44 x 48, 3.75-yard		.04⅛ @
44 x 40, 4.25-yard		.04 @

SHEETINGS, 36-INCH

48 x 48, 5.00-yard	yd.	.03⅜ @
44 x 40, 6.15-yard		.03 @

Tire Fabrics

BUILDER

17¼ oz. 60" 23/11 ply Karded peeler	lb.	.22 @
17¼ oz. 60" 10/5 ply Karded peeler	lb.	.20 @

CHAFER

14 oz. 60" 20/8 ply Karded peeler	lb.	.22 @
12 oz. 60" 10/4 ply Karded peeler	lb.	.18 @
9¼ oz. 60" 20/4 ply Karded peeler	lb.	.24 @
9¼ oz. 60" 10/2 ply Karded peeler	lb.	.20 @

CORD FABRICS

23/5/3 Karded peeler, 1 1/32" cotton	lb.	.22 @
23/4/3 Karded peeler, 1 1/32" cotton	lb.	.24 @
15/3/3 Karded peeler, 1 1/32" cotton	lb.	.20 @
13/3/3 Karded peeler, 1 1/32" cotton	lb.	.19 @
7/2/2 Karded peeler, 1 1/32" cotton	lb.	.19 @
23/5/3 Karded peeler, 1¼" cotton	lb.	.27 @
23/5/3 Karded Egyptian, Egyptian uppers cotton	lb.	.34 @
23/5/3 Combed Egyptian.	lb.	.40 @

LENO BREAKER

8¼ oz. and 10¼ oz. 60" Karded peeler	lb.	.22 @

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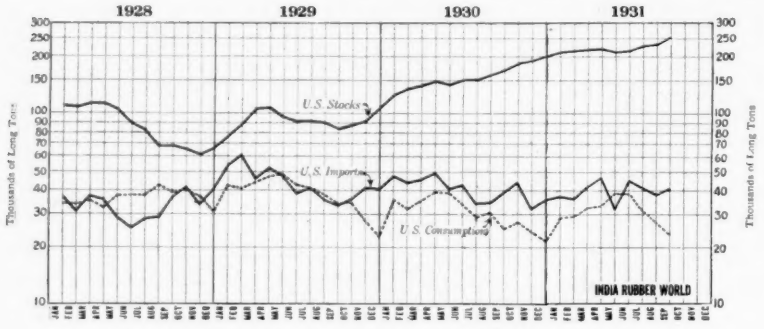
Imports, Consumption, and Stocks



United States Stocks, Imports, and Consumption

CONSUMPTION of crude rubber by manufacturers in the United States for the month of September decreased 14 per cent as compared with August. The usual seasonal decline is 11 per cent. September consumption is estimated to be 23,638 long tons as compared with 27,586 long tons for August and 25,515 for September, 1930.

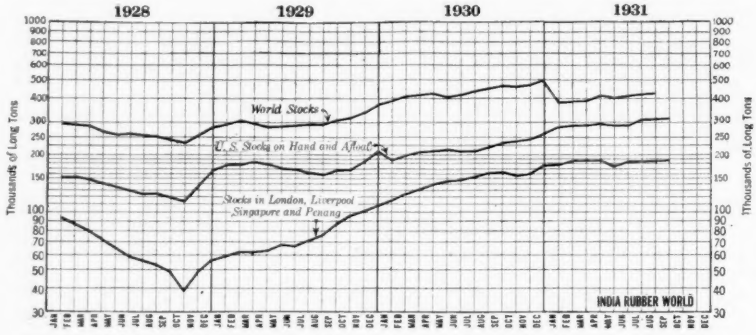
Imports of crude rubber for September amounted to 40,505 long tons, an increase of 5.6 per cent over the August figure of 38,370 long tons and 2.6 per cent above September, 1930.

The estimated total domestic stocks of crude rubber on hand September 30 were 254,324 long tons, an increase of 5.6 per cent over August and 49.7 per cent over September 30, 1930.

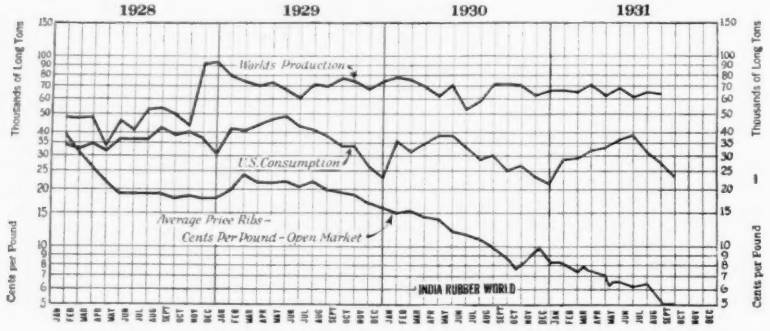
Crude rubber afloat for the United States ports on September 30 was estimated at 62,420 long tons as against 61,469, August 31 and 60,924, September 30, 1930.

Japanese Consumption and Stocks

Owing to Japan's nearness to sources of supply there is very little fluctuation in the quantity of rubber held in stock in Japan, there being a close agreement between imports and consumption. Stocks in Japan at the end of June are believed to have amounted to about 6,500 long tons (dealers 4,000 and manufacturers 2,500). Since



World, United States, London, Liverpool, Singapore and Penang Stocks



World's Production, U. S. Consumption, and Price of Ribs

monthly consumption averages around 3,000 tons, stocks represent little more than two months' supply, which is considered about normal and is expected to continue for the balance of the year. The heavy consumption period is from the first of October to the end of January and is at its lowest in the 3 summer months. (Trade Commissioner Paul P. Steintorf, Tokyo.)

London and Liverpool Stocks

Week Ended	Tons	
	London	Liverpool
Sept. 26	80,055	54,779
Oct. 3	79,246	54,677
Oct. 10	78,735	55,518
Oct. 17	78,704	55,276
Oct. 24	78,465	55,797

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang Stocks, Etc.†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks U. S. A., U. K., Singapore, and Penang†‡ Tons
1926	411,962	358,415	72,510	51,238	51,320	26,443	621,900	542,000	273,060
1927	431,807	372,528	100,130	47,938	66,261	25,798	607,300	593,866	298,780
1928	446,421	442,227	66,166	68,764	22,603	32,905	653,837	686,945	284,198
1929	561,454	466,475	105,138	62,389	73,253	35,548	860,404	804,820	371,425
1930	488,343	375,980	200,998	56,035	120,575	46,003	815,835	702,935	492,165
1931									
January	37,098	28,557	209,487	56,188	124,336	48,306	65,714	49,620	382,129
February	36,645	28,797	212,834	63,680	126,874	48,164	65,719	59,970	387,872
March	40,338	32,788	218,317	63,133	133,013	48,300	71,218	59,980	399,630
April	46,648	33,321	228,383	56,700	138,144	44,857	63,395	51,200	411,384
May	31,720	37,817	220,799	73,564	138,945	43,212	68,628	63,190	402,936
June	45,776	37,916	225,536	69,421	136,233	46,573	62,090	64,050	409,132
July	41,004	31,937	234,822	66,873	135,916	50,021	66,600	58,240	420,759
August	38,370	27,586	240,817	61,469	136,956	48,010	65,392	54,750	425,782
September	40,505	23,638	254,324	62,420	.....	.....	.....	.....	.....

*Including liquid latex, but not guayule.
†Stocks on hand the last of the month or year.
‡W. H. Rickinson & Son's 1931 figures.

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Rubber Scrap

INTEREST in the rubber scrap market still remains dormant as it has for several months. While production of reclaim has been declining, rubber scrap stocks are not increasing for the same reason. From now on collections will gradually decrease because of the approach of Winter. This seasonal decline is beginning somewhat earlier than usual on account of current low prices and restricted consuming demand.

Trunk Line Association Proposal No. 27,725 proposes to establish a reduced rate of 7½ cents per 100 pounds on scrap rubber, carloads, from Binghamton, N. Y., to Johnson City, N. Y.

BOOTS AND SHOES. Trade is quiet in scrap boots and shoes. Stocks are ample and easily maintained by moderately active collections. The market quotations for all grades in this group have held steady and unchanged for the past quarter.

INNER TUBES. Collections are still very light. Quotations on No. 1, floating grade are unchanged from one month ago. No. 2, compounded grade is quoted this month ¼-cent lower as an upper limit, thus reducing the spread of quotations by that amount.

TIRES. All grades are fairly active with collections moderate. Freight rates are such that stock cannot be moved economically at present prices but must be disposed of locally at a very narrow margin. On pneumatic tire grades quotations are unchanged except in the case of "Mixed auto tires with beads," which is quoted down 25 cents a ton from last month.

Solid tires are in very good demand. Clean mixed truck has advanced 50 cents to $1.50 per ton. The spread of current quotations on this grade is $22 to $23.50. Light gravity solids are quoted unchanged.

MECHANICALS. All grades are very dull and quoted unchanged.

HARD RUBBER. Prime quality is gradually disappearing from the market and will ultimately become extinct as a scrap market grade. The price is unchanged.

CONSUMERS' BUYING PRICES

Carload Lots

Delivered Eastern Mills
October 26, 1931

		Prices
Boots and Shoes		
Boots and shoes, black	100 lb.	$1.00 flat
Colored	100 lb.	.625 @ .75
Untrimmed arctics	100 lb.	.625 @ .75
Tennis shoes and soles	100 lb.	.50 @ .60
Inner Tubes		
No. 1, floating	lb.	.03¾ @ .04
No. 2, compound	lb.	.01¾ @ .01⅞
Red	lb.	.01⅜ @ .01½
Mixed tubes	lb.	.01½ @ .01⅝
Tires		
Pneumatic Standard		
Mixed auto tires with beads	ton	8.75 @ 9.00
Beadless	ton	13.00 @13.25
Auto tire carcass	ton	12.00 @12.50
Black auto peelings	ton	19.50 @20.00
Solid		
Clean mixed truck	ton	22.00 @23.50
Light gravity	ton	30.00 @31.00
Mechanicals		
Mixed black scrap	lb.	.00½ @ .00¾
Hose, air brake	ton	8.00 @ 9.00
Garden, rubber covered	lb.	.00½ @ .00½
Steam and water, soft	lb.	.00¾ @ .00½
No. 1 red	lb.	.01¼ @ .01¼
No. 2 red	lb.	.01 @ .01⅛
White druggists' sundries	lb.	.01½ @ .01¾
Mechanical	lb.	.01 @ .01⅛
Hard Rubber		
No. 1 hard rubber	lb.	.08¾ @ .09

N. Y. Outside Market

(*Continued from page 98*)

France, and Italy for a temporary period."

Prices at the close of October 17 were:

Spot	Oct. 17	Month Ago	Year Ago
Crepe	5⅜	5½	8¼
Ribs	5	5⅛	7⅞
Upriver fine	6	6⅝	12

Week ended October 24. Although prices were firmer, there was no indication that it was a result of increased buying. The prospect of greatly increased shipments from the Far East and the shutdown by several of the largest automobile producers were responsible for an easing of the market after it had expanded in response to firmer cables from England, where the lower value of the pound has bolstered prices.

Automobile production, as estimated by Cram's automotive reports, was 142,651 units, against 228,606 in September, 1930. Sales in September were estimated at 118,000 units against 155,709 units in August and 175,286 units in September, 1930.

In view of the depressed state of the automobile industry here, the speech of Andre Citroen, president of Citroen Motors and official representative of the French Automotive industry, is interesting. At a conference held at Columbia University, Mr. Citroen proposed an international cartel, which would have the exclusive right to sell motor cars in the 107 countries where they do not themselves produce automobiles. He further proposed an international plan for road construction, which would not only save a vast sum by eliminating "costly competition," but would relieve unemployment.

Prices at the close of October 24 were:

Spot	Oct. 24	Month Ago	Year Ago
Crepe	5⅛	5¼	8⅞
Ribs	4⅛	4⅞	8½
Upriver fine	6	6⅛	12

Actuals on October 26 declined in sympathy with the quotations on the New York Rubber Exchange. Spot ribs were available at 4¾ cents, but very little buying interest was shown.

Gymnasium Rubber Pans

Heavy rubber pans for containing sodium hypochlorite solution have been installed in all the gymnasiums of the physical training department of the Buffalo high schools. Students going to and from gymnasium classes are required to wash their feet in a one per cent solution of sodium hypochlorite as a precaution against the infection popularly known as athlete's foot.

FINANCIAL

Boston Woven Hose & Rubber Co.

Boston Woven Hose & Rubber Co., Boston, Mass., reports for the year ended August 31, 1931, net profits of $277,656 after taxes and depreciation, but before extraordinary charges. Such earnings are equal after 6 per cent dividends on $750,000 preferred stock to $2.70 per share on the 86,000 shares of common stock, and compare with common share earnings of $6.44 in 1930 and $11.80 in the previous fiscal year.

Balance sheet as of August 31, 1931, shows current assets of $3,469,832 and current liabilities of $274,214 giving working capital of $3,195,618, against $3,459,534 previous year.

President J. N. Smith says, in part: "Decrease in sales for the year has been $2,940,000 or 32 per cent, and the decrease in poundage shipped amounted to 10,770,000 pounds or 25 per cent. Following last year's severe price declines in rubber and cotton fabrics there have been declines this year of approximately 50 per cent in crude rubber and 25 per cent in cotton duck and sheetings. It is reasonable to expect greater stability from now on in price level of our merchandise and a relief from the heavy write-offs which have been sustained during the past few years.

"The company is out of debt and has for the first time in its history gone through the year without borrowing."

Kelly-Springfield

Kelly-Springfield Tire Co., for the third quarter ending September 30, 1931, showed an operating profit of $399,082 before depreciation and other charges and net profit of $214,662 after these deductions, according to a recent statement by President William H. Lalley.

"The affairs of the company are showing a progressive improvement," he stated. "We have been able to report a net profit for each month since May 1 of this year. As of September 30 our ratio of current assets to current liabilities was 30 to 1, while as of September 30, 1930, the current ratio was 5.3 to 1. Furthermore we are free of bank loans as compared with bank loans of $1,500,000 as of September 30, 1930.

"Despite general business conditions our sales have held at a steady level; in fact, our shipments to dealers for the first 9 months of 1931 exceeded those for the same period in 1930."

Faultless Rubber Co.

The Faultless Rubber Co., Ashland, Pa., reports for the year ended June 30, 1931, profit of $314,721 after all charges but before federal taxes, comparing with $366,273 for year ended June 30, 1930. Current assets as of June 30, 1931, amounted to $974,832 and current liabilities $40,262.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Faultless Rubber Co.	Com.	$0.62½ q.	Jan. 2	Dec. 16
General Tire & Rubber Co.	Com.	$0.75 q.	Oct. 31	Oct. 20
Goodyear Tire & Rubber Co.	Pfd.	$1.75 q.	Jan. 1	Dec. 1
National-Standard Co.	Com.	$0.75 q.	Oct. 1	Sept. 18

CLASSIFIED ADVERTISEMENTS

SITUATIONS WANTED

FACTORY SUPERINTENDENT OR DEPARTMENT SUPERINtendent available for immediate connection. Years of practical experience and thorough training gives him complete background. Especially valuable in rubberizing and calendering, mill room, curing, and compounding. Will accept moderate salary to start where good future is offered. Will go anywhere. Best of references. Address Box No. 11,054, care of INDIA RUBBER WORLD.

OPEN FOR POSITION AS CHEMIST COMPOUNDER, WITH both practical and technical experience in compounding and development work, particularly in mechanical goods, heels, soles, mats, mattings, tile flooring, transparent articles, asbestos and rubber packings, brake linings, either compressed-woven or folded, electricians' tapes, cements, plumbers', railroad, or oil well supplies, novelties, sponge rubber, office and auto accessories. Years of practical experience in up-to-date compounding. A-1 references furnished on request. Address Box No. 11,057, care of INDIA RUBBER WORLD.

RUBBER CHEMIST, AGE THIRTY-SEVEN, SINGLE, FIFTEEN years' varied experience in the analysis, compounding, control, testing and reclaiming of rubber goods, is available for any suitable position. Address Box No. 11,058, care of INDIA RUBBER WORLD.

MODERN SPECIALIST OF RUBBER SHOES, doctor-engineer, studied chemistry at a German technical high school, with many years' experience in manufacturing rubber shoes at one of the most important factories of Europe, offers his services. Best references. Apply to: Doctor Weins, Fleischergasse 60 a', Free City of Danzig, Germany.

COMPOUNDER AND DEVELOPMENT MAN, EIGHT YEARS COMpounding and development work, hard and soft rubber, hose, tapes, molded goods, dipped goods, tiling, battery cases, etc. College trained. Available November 15. Address Box No. 11,059, care of INDIA RUBBER WORLD.

RUBBER TECHNOLOGIST WOULD LIKE TO CONTACT WITH one or two smaller rubber companies on part-time basis to help solve their compounding and factory difficulties. Why not take advantage of my years of technical and factory experience without the expense of maintaining a laboratory of your own? Address Box No. 11,060, care of INDIA RUBBER WORLD.

SITUATION WANTED: CHEMIST, AGE THIRTY-SIX, MARRIED, university graduate, desires permanent position. Good technical training backed by eleven years' experience in alkalis, acids, and heavy chemicals, organic accelerators, rubber and rubber reclaiming manufacture. Moderate salary. Available immediately. Address Box No. 11,061, care of INDIA RUBBER WORLD.

FACTORY SUPERINTENDENT AND CHEMIST, DESIROUS OF immediate change, years of experience in the development and production of the following items: mechanical goods, oil proof and sheet packing, tiling, matting, plumbing goods, sport soles, heels, taps, soling sheets and shoe findings, extruded products, transparent stocks, and sponge rubber. Wish to make permanent connection with small progressive concern. Address Box No. 11,062, care of INDIA RUBBER WORLD.

TUBING FOREMAN: YOUNG MAN, WITH PRACTICAL EXPERIence in fountain syringes, druggists' sundries, fine tubing, washers and mechanicals, would like position with reliable concern. Best of references. Address Box No. 11,064, care of INDIA RUBBER WORLD.

INTERNATIONAL PULP CO.
41 Park Row, NEW YORK, N. Y.
SOLE PRODUCERS
ASBESTINE
REG. U. S. PAT. OFF.

MECHANICAL MOLDED RUBBER GOODS
We Solicit Your Inquiries
THE BARR RUBBER PRODUCTS COMPANY
SANDUSKY, OHIO

SITUATIONS WANTED

FACTORY SUPERINTENDENT, AGE FORTY-ONE, WITH TWENTYtwo years of experience in rubberizing, calendering, footwear, balls, soles, heels, auto cloth, specialties, etc. Would like to become connected with A-1 concern. Has his own up-to-date formulas and can handle the works from start to finish. Just arrived from six months' studying trip abroad. Address Box No. 11,063, care of INDIA RUBBER WORLD.

VULCANIZING FOREMAN: YOUNG MAN, WITH PRACTICAL EXperience in steam and dry heat curing of druggists' sundries, hand made and dipped goods, sporting goods, gloves, tubing, and hard rubber, would like position with reliable concern. Best of references. Address Box No. 11,065, care of INDIA RUBBER WORLD.

POSITION WANTED: CHEMICAL ENGINEER, EXPERIENCED in the production, buying, compounding, and costing, in the manufacture of golf-ball thread and textile rubber thread. Address Box No. 11,066, care of INDIA RUBBER WORLD.

FACTORY MANAGER OR SUPERINTENDENT: TECHNICALLY schooled, fifteen years' actual managerial experience, absolutely familiar with costs, purchasing, compounding, and latest methods of production in manufacture of belting of all types, wrapped hose, fabric or wire types, molded garden hose, miscellaneous molded goods, fire hose, heels, soles, and hard rubber goods. Reputed excellent handler of men. Address Box No. 11,067, care of INDIA RUBBER WORLD.

SITUATION OPEN

NEW YORK FIRM WANTS PRACTICAL MAN TO SELL RUBBER rollers, etc. Address Box No. 11,068, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

FOR SALE: CONTROL OF GOING RUBBER MANUFACTURING concern in Michigan. Owner retiring on account of illness. Specialized molded goods. Plant well equipped. Has made substantial earnings during periods of depression. Price attractive. Address Box No. 11,053, care of INDIA RUBBER WORLD.

WE CAN FINANCE, DEVELOP, MANUFACTURE, AND MARKET, on a satisfactory basis, your ideas for rubber products. Address Box No. 11,055, care of INDIA RUBBER WORLD.

THE LARGEST HIGH-GRADE MECHANICAL RUBBER GOODS plant on the Pacific Coast desires new patented or patentable items to manufacture, especially black molded goods. Address Box No. 11,056, care of INDIA RUBBER WORLD.

WANTED: Manufacturer or financier to market a novelty rubber wash board which can be used over a bath tub. Patent pending. Also a sanitary shower bath curtain. Patent pending. Royalty Basis.
BERRY, 241 W. 113th St., New York, N. Y.

Fort Hill Engraving Co. Inc.
113 Pearl Street . . . . . Boston, Mass.
ESTABLISHED 1908
Producers of Dies for Embossing Rubber Soles—Outsole Medallions—Size and Width Stamps—Ankle Patch Dies—Stamping Dies for all kinds of rubber products.

CALENDER SHELLS
any diameter, any length.
The W. F. Gammeter Co.
Cadiz, Ohio

(Advertisements continued on page 113)

Types of Rubber Imported into the U. S.

Long Tons

Year	Plantations	Paras	Africans	Guayule	Centrals* and Miscellaneous	Total
1916	85,531	22,060	3,591	1,140	3,287	115,609
1917	134,946	25,225	3,330	1,863	1,698	167,062
1918	133,167	20,086	730	1,329	906	156,218
1919	197,748	27,058	3,340	1,501	1,864	231,511
1920	195,972	18,391	3,881	1,037	799	220,080
1921	173,975	10,915	2,329	58	86	187,363
1922	276,649	11,092	2,691	281	257	290,970
1923	282,491	11,925	3,503	1,224	716	299,859
1924	295,055	12,879	3,769	1,345	1,010	314,058
1925	356,731	16,376	3,010	3,505	5,215	384,837
1926	386,748	13,184	3,619	3,524	4,887	411,962
1927	405,543	17,576	2,073	3,856	3,268	432,316
1928	429,191	12,050	1,250	3,364	558	446,413
1929	548,997	10,405	445	1,251	356	561,454
1930	479,625	7,172	337	1,011	198	488,343

* Manicoba and Matto Grosso rubber imported included with Centrals.
Compiled by the Rubber Manufacturers Association, Inc.

Principal Rubber Stocks

Long Tons—1931

	Apr.	May	June	July	Aug.	Sept.
Malay Estates	21,406	21,901	22,101	23,116	23,855	22,036
S. S. Dealers	41,456	40,069	42,066	42,649	42,393	38,411
Other Malay Dealers	15,697	15,270	16,647	17,261	16,751	15,078
Malayan Ports	3,401	3,143	5,915	7,372	5,617	7,657
Totals	81,960	80,383	86,729	90,398	88,616	83,182
London	86,982	86,726	83,071	81,317	81,560	*79,630
Liverpool	51,879	53,668	53,975	54,833	55,428	*54,700
Totals	138,861	140,394	137,046	136,150	136,988	*134,330
U. S. Inventory	224,211	219,405	225,346	235,746	244,627	.....
U. S. Afloat	56,700	73,564	69,421	66,873	61,469	62,420
Europe Afloat	18,500	17,770	18,440	19,960	18,880	.....
Totals	75,200	91,334	87,861	86,833	80,349	.....
Grand totals	520,232	531,516	536,982	549,127	550,580	.....

*Estimate.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

World Rubber Shipments—Net Exports

Long Tons

	Calendar Years		1931			
	1929	1930	June	July	Aug.	Sept.
British Malaya						
Gross Exports	579,524	547,043	39,505	43,658	42,832	44,336
Imports	161,612	133,876	12,115	11,995	9,063	8,369
Net	417,912	413,167	27,390	31,663	33,769	35,967
Ceylon	80,795	76,406	5,098	4,517	*3,764	*4,202
India and Burma	11,720	10,782	1,086	715	406	...
Sarawak	11,079	10,310	1,138	801	692	701
British No. Borneo	7,381	7,052	*500	*500	*500	*500
Siam	5,024	4,349	337	316	210	218
Java and Madura	66,010	69,755	5,856	6,671	6,397	.....
Sumatra E. Coast	87,589	79,396	6,697	7,510	7,044	.....
Other N. E. Indies	134,732	115,254	11,381	10,711	8,641	.....
French Indo-China	10,147	9,877	938	*841	*983	*922
Amazon Valley	21,148	14,260	621	1,565	856	745
Other America	996	516	*5	*10	*10	*10
Guayule	1,275	1,095	.....	.....	.....	.....
Africa	4,596	3,961	*300	*300	*300	*300
Totals	860,404	816,180	61,347	66,120	63,572	.....

*Estimate. *Compiled by Rubber Division, Department of Commerce, Washington, D. C.*

London Stocks, August, 1931

	Landed Tons	Delivered Tons	Stocks, August 31: 1931 Tons	1930 Tons	1929 Tons
LONDON					
Plantation	4,850	4,617	81,474	80,839	35,498
Other grades	21	11	54	47	54
LIVERPOOL					
Plantation	*5,269	*4,674	*55,428	*29,670	*7,507
Total tons, London and Liverpool	10,140	9,302	136,956	110,556	43,059

* Official returns from the recognized public warehouses.

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	June, 1931 Pounds	June, 1931 Value	Three Months Ended June, 1931 Pounds	Three Months Ended June, 1931 Value
UNMANUFACTURED				
Rubber, gutta percha, etc	4,730,546	$344,298	15,522,626	$1,174,853
Rubber, recovered	1,082,800	49,372	2,900,300	135,006
Rubber and gutta percha scrap	169,700	5,600	653,400	16,028
Balata	1,050	1,114	4,658	3,619
Rubber substitute	20,300	2,224	89,600	9,896
Totals	6,004,396	$402,608	19,170,584	$1,339,402
PARTLY MANUFACTURED				
Hard rubber sheets and rods	1,806	$969	5,879	$3,625
Hard rubber tubes	.....	47	.....	465
Rubber thread not covered	35,733	29,559	107,499	90,980
Totals	37,539	$30,575	113,378	$95,070
MANUFACTURED				
Belting	.....	$6,475	.....	$29,687
Hose	.....	5,336	.....	23,032
Packing	.....	3,918	.....	14,532
Boots and shoes *pairs*	1,309	969	14,436	5,522
Clothing, including waterproofed	.....	4,716	.....	20,140
Raincoats	1,234	3,303	11,772	28,232
Gaskets	.....	.....	.....	.....
Gloves	.....	1,863	.....	5,323
Hot water bottles	.....	2,037	.....	4,713
Tires, bicycle *number*	4,997	2,429	26,446	12,413
Pneumatic *number*	7,151	37,815	21,498	116,205
Inner tubes *number*	2,333	2,613	4,740	4,735
Solid for automobiles and motor trucks *number*	42	1,923	162	5,101
Other solid tires	.....	4,057	.....	8,813
Mats and matting	.....	3,665	.....	13,920
Cement	.....	9,597	.....	16,308
Golf balls *dozen*	9,337	26,111	26,003	*77,637
Heels *pairs*	49,382	1,775	194,603	6,341
Other rubber manufactures	.....	102,945	.....	330,816
Totals	.....	$221,547	.....	$723,470
Totals, rubber imports	.....	$654,730	.....	$2,157,942

Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Re-exports of Foreign Goods Value	Produce of Canada Value	Re-exports of Foreign Goods Value
UNMANUFACTURED				
Waste rubber	$6,963	.....	$16,250	.....
MANUFACTURED				
Belting	$23,175	.....	$56,019	.....
Canvas shoes with rubber soles	100,028	.....	726,081	.....
Boots and shoes	68,828	.....	228,050	.....
Clothing, including waterproofed	7,361	.....	15,696	.....
Hose	17,014	.....	31,624	.....
Tires, bicycle	565	.....	3,348	.....
Pneumatic	569,879	.....	1,620,087	.....
Inner tubes	57,084	.....	172,775	.....
Solid	73	.....	679	.....
Other rubber manufactures	135,044	$5,050	346,384	$10,141
Totals	$979,051	$5,050	$3,200,743	$10,141
Totals, rubber exports	$986,014	$5,050	$3,216,993	$10,141

United States Crude and Waste Rubber Imports for 1931 by Months

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Totals 1931	Totals 1930	Balata	Miscellaneous	Waste
January *tons*	36,525	206	331	36	..	..	..	37,098	47,362	65	960	38
February	35,749	339	516	40	1	..	..	36,645	43,728	1	580	..
March	38,922	352	1,062	2	..	..	..	40,338	45,430	170	800	..
April	46,034	323	291	..	..	..	..	46,648	49,927	196	908	60
May	30,962	248	508	2	..	..	..	31,720	40,745	78	450	2
June	44,495	601	640	40	..	..	..	45,776	42,653	271	892	6
July	40,477	316	211	..	..	..	..	41,004	34,084	131	519	6
August	37,920	328	121	1	..	..	..	38,370	34,558	82	375	13
September	39,831	341	294	39	..	..	..	40,505	39,467	89	592	20
Total, nine months, 1931 *tons*	350,915	3,054	3,974	160	1	..	..	358,104	.....	1,083	6,076	145
Total, nine months, 1930 *tons*	367,601	3,196	5,675	321	189	972	..	.....	377,954	965	6,617	458

Compiled from Rubber Manufacturers Association statistics.

Classified Advertisements

CONTINUED

MACHINERY AND SUPPLIES FOR SALE

FOR SALE Vulcanizing Oven 6 by 8 feet; 41-inch mill with motor complete; No. 1 Royle tuber, crescent head.
P. O. BOX 385, PAWTUCKET, R. I.

FOR SALE: Machinery of completely equipped tire factory including three calenders, nineteen mills and crackers, vulcanizers, tube machines, boilers, compressors, electric equipment, etc., at extremely low prices. Located on waterfront San Diego, California. Terms may be arranged.
Apply: GATES, RADFORD AND LAMB
400-432 N. Avenue 19, Los Angeles, Calif.

New and Used
RUBBER MACHINERY
M. Norton & Co.
Medford, Mass.

CLEARING HOUSE FOR USED MACHINERY, EQUIPMENT AND OVERSTOCKS

GEORGE W. SHERMAN
964 Hazel St. AKRON, OHIO
MAIL ADDRESS P. O. BOX 630.
We are now selling, for the owners, the machinery and equipment from the American Tire & Rubber Co., Akron, Ohio.

Rubber Molds — Tools — Dies — Special Machinery—and Mechanical Rubber Goods Molds
THE COLUMBIA RUBBER MOLD CO.
968 East 69th Place, Cleveland, O.

The Franz Foundry & Machine Co.
AKRON, OHIO
MOLDS, CORES AND RUBBER MACHINERY
HEATER PRESSES, ENGRAVING MACHINES
WATCH CASE HEATERS, RETREAD EQUIPMENT

FOR SALE

One Birmingham 72" x 18' 6" hydraulic belt press.
One Farrel 42" x 18', one 30" x 20' belt press.
One 3 roll embossing calender.
Textile Finishing Machine Co.'s can driers.
Twelve 20" x 22" x 60" mills.
Twenty 42" to 60" mills.
Ten crackers.
Three and four roll calenders.
Two No. 3 Banbury mixers.
Forty hydraulic presses 24" x 24" to 48" x 48".
Hydraulic pumps and accumulators.
Curtis & Marble brush machines 64" to 88" width.
Two Day jacketed two arm mixers, dough mix type.
Five upright 200 gallon churns.
18 churns 32" x 40".
Five American Tool & Machine Co.'s spreaders 42" to 54".
One 59" doubling calender
Four Farrel 250 H. P. drives.
W & P experimental mixer, 2 roll sheeting calender.
One Day Pony mixer 2½ gallon; one 8 gallon capacity.
Four Dinking machines
Three Devine driers.
Two Peerless rubber cutters.
One 8' x 40' vulcanizer, Devine quick open door
We have lots of other good used equipment too numerous to mention.

LAWRENCE N. BARRY, Inc., 41 Locust St., Medford, Mass.

Let me *take care of your chemical work and manufacturing problems on a monthly fee basis.*
Write for particulars
Frederick J. Maywald
Rubber Chemist
303 Hoboken Road Carlstadt, N. J.

CRUDE RUBBER
Balata
Gutta Percha
Liquid Rubber Latex

GEO. HANKIN
and Company
21 MINCING LANE
LONDON, E. C. 3

Cables:
Vademecum, Outerly } London

Just tell them what you can do

The main thing is TO BE HERE, REGULARLY, to make your facilities clear, to tell enough to develop the confidence that acquires orders. Rates are low. Results speak for themselves.

PURE GUM THREAD AND TAPE
FOR GOLF BALL AND KINDRED MANUFACTURE
COMPOSITION, CURE, BEHAVIOR **UNIFORM** STRENGTH (Grainless), SURFACE FRICTION, CROSS SECTION
Long aging, non-blooming, unaffected by accelerators, vulcanizing agents or heat during manufacture of vulcanized cover. Has all the advantages and superiority typical of accelerated stock cured at low temperature. The only thread cut absolutely orthogonally available in United States and Canada.
EACH THREAD INDIVIDUALLY INSPECTED BY EXPERTS
Address Inquiries: MATERIALS DIVISION
I. T. GURMAN, Consulting Chemical Engineer
Golf Ball Specialist
64 FAULKNER STREET MALDEN, MASS.
PLANT LAYOUT AND OPERATION
DEVELOPMENTS FORMULAS PROCESSES

(*Advertisements continued on page* 115)

United States Statistics

Imports of Crude and Manufactured Rubber

	July, 1931		Seven Months Ended July, 1931	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	97,370,808	$6,023,748	628,254,071	$47,654,292
Liquid latex	1,304,839	104,868	6,792,785	625,896
Jelutong or pontianak	741,852	64,493	7,578,508	665,304
Balata	150,857	20,777	1,746,979	283,111
Gutta percha	2,134	2,890	178,770	22,642
Guayule	.....	.....	.....	.....
Siak, scrap, and reclaimed	601,970	4,790	5,269,386	52,934
Totals	100,172,460	$6,221,566	649,820,499	$49,304,179
Chicle, crude *Free*	175,358	$84,799	5,848,328	$2,771,336
MANUFACTURED—*Dutiable*				
Tires *number*	1,880	$9,397	14,294	$52,160
Other rubber manufactures	.....	71,571	.....	519,607
Totals	.....	$80,968	.....	$571,767

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	3,492,043	$241,810	36,718,910	$2,983,816
Balata	11,310	2,300	84,808	22,489
Guayule	1,100	137	25,800	3,712
Gutta percha, rubber substitutes, and scrap	.....	.....	10,122	1,802
Rubber manufactures	.....	2,066	.....	6,463
Totals	.....	$246,313	.....	$3,018,282

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	928,780	$40,610	10,128,300	$482,535
Scrap and old	5,115,503	98,648	29,393,594	700,766
Rubberized automobile cloth *sq. yd.*	83,136	35,253	573,765	257,527
Other rubberized piece goods and hospital sheeting *sq. yd.*	105,141	38,800	739,857	303,653
Footwear				
Boots *pairs*	81,928	190,417	283,189	685,899
Shoes *pairs*	58,175	49,133	465,056	327,680
Canvas shoes with rubber soles *pairs*	73,269	48,109	1,136,134	724,940
Soles *doz. pairs*	5,800	15,132	48,999	129,703
Heels *doz. pairs*	58,443	35,188	479,204	316,409
Water bottles and fountain syringes *number*	29,446	13,078	185,623	82,178
Gloves *doz. pairs*	7,289	17,665	55,049	139,107
Other druggists' sundries	.....	25,578	.....	196,413
Balloons *gross*	51,731	47,833	369,832	334,939
Toys and balls	.....	11,506	.....	74,636
Bathing caps *doz.*	4,514	8,048	102,383	199,576
Bands	34,097	10,765	289,611	108,131
Erasers	34,029	20,411	268,657	160,174
Hard rubber goods				
Electrical goods	33,779	4,097	722,791	81,024
Other goods	.....	22,013	.....	148,606
Tires				
Truck and bus casings, *number*	29,589	525,577	252,858	5,135,018
Other automobile casings, *number*	119,001	934,621	927,190	7,049,394
Tubes, auto *number*	113,251	145,784	766,154	1,044,037
Other casings and tubes, *number*	5,490	11,690	58,149	115,053
Solid tires for automobiles and motor trucks *number*	1,133	34,337	7,472	242,157
Other solid tires	118,308	16,151	975,795	136,176
Tire sundries and repair materials	.....	79,543	.....	515,213
Rubber and friction tape	103,093	26,764	718,230	198,595
Belting	342,609	141,227	2,097,396	928,943
Hose	467,585	136,983	3,187,397	944,311
Packing	100,786	43,480	831,275	343,800
Thread	74,278	47,009	916,666	783,458
Other rubber manufactures	.....	111,978	.....	1,030,942
Totals	.....	$2,987,428	.....	$23,920,993

Crude Rubber Imports by Customs Districts

Including latex dry rubber content

	August, 1931		August, 1930	
	Pounds	Value	Pounds	Value
Massachusetts	3,529,210	$245,328	2,730,685	$327,928
New York	74,163,438	4,430,268	70,800,495	8,530,431
Philadelphia	335,380	19,320	.....	.....
Maryland	2,611,087	140,354	92,575	9,910
Georgia	407,668	22,296	528,195	62,494
Los Angeles	5,459,530	286,126	6,986,433	845,207
San Francisco	51,022	3,220	167,068	20,253
Oregon	11,200	638	.....	.....
Ohio	25,151	1,558	582,401	98,687
Colorado	840,000	49,654	224,000	24,579
Totals	87,433,686	$5,198,762	82,111,852	$9,919,489

United Kingdom Statistics

Imports

UNMANUFACTURED	August, 1931		Eight Months Ended August, 1931	
Crude Rubber From	Pounds	Value	Pounds	Value
Straits Settlements	8,677,900	£105,273	99,799,800	£1,492,863
Federated Malay States	3,296,000	42,539	44,171,600	705,656
British India	804,800	9,398	9,429,500	143,236
Ceylon and Dependencies	987,700	11,332	17,650,000	274,770
Java and Dutch Borneo	2,646,100	38,302	20,986,800	325,316
Sumatra and other Dutch possessions in Indian Seas	865,800	11,078	11,620,700	184,743
Other countries in East Indies and Pacific not elsewhere specified	382,700	4,836	2,712,300	42,846
Brazil	747,900	11,262	3,938,200	74,841
South and Central America (except Brazil)	.....	.....	42,400	595
West Africa				
French West and Equatorial Africa	.....	.....	25,400	444
Gold Coast	.....	.....	175,500	2,666
Other parts of West Africa	321,900	3,498	1,472,800	22,505
East Africa, including Madagascar	9,600	91	184,500	2,940
Other countries	197,600	2,767	812,300	15,296
Totals	18,938,000	£240,376	213,021,800	£3,288,717
Gutta percha and balata	146,700	7,958	2,095,500	141,431
Waste and reclaimed rubber	491,200	4,804	5,266,000	49,209
Rubber substitutes, synthetic	1,300	31	13,000	355
Totals	19,577,200	£253,169	220,396,300	£3,479,712
MANUFACTURED				
*Tires and tubes				
Pneumatic				
Outer covers	.....	£16,782	.....	£139,314
Inner tubes	.....	5,077	.....	42,345
Solid tires	.....	4,794	.....	26,260
Boots and shoes *doz. pairs*	77,168	140,450	889,656	1,014,390
Other rubber manufactures	.....	128,489	.....	1,168,371
Totals	.....	£295,592	.....	£2,390,680

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	1,302,100	£8,117	9,717,000	£61,668
Rubber substitutes, synthetic	27,900	745	289,500	5,711
Totals	1,330,000	£8,862	10,006,500	£67,379
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£218,290	.....	£2,002,654
Inner tubes	.....	27,008	.....	246,128
Solid tires	.....	4,390	.....	38,083
Boots and shoes *doz. pairs*	14,372	19,776	128,282	160,349
Other rubber manufactures	.....	124,544	.....	1,343,805
Totals	.....	£394,008	.....	£3,791,019

Exports—Colonial and Foreign

UNMANUFACTURED				
Crude Rubber To				
Soviet Union (Russia)	3,505,400	£57,919	21,241,600	£504,036
Sweden, Norway, and Denmark	58,600	1,610	1,451,100	29,244
Germany	1,965,600	26,342	13,465,000	219,298
Belgium	493,200	7,247	7,046,100	116,535
France	910,200	13,446	11,004,300	203,366
Spain	33,600	744	775,600	20,654
Italy	276,700	3,748	2,946,200	47,467
Other countries in Europe	161,900	2,845	2,189,700	52,358
United States	122,300	1,589	1,767,400	40,741
Other countries	142,300	2,948	1,109,800	27,358
Totals	7,669,800	£118,438	62,996,800	£1,261,057
Gutta percha and balata	28,500	2,017	374,900	34,148
Waste and reclaimed rubber	1,800	21	150,300	2,105
Rubber substitutes, synthetic	.....	.....	1,400	18
Totals	7,700,100	£120,476	63,523,400	£1,297,328
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£4,420	.....	£57,424
Inner tubes	.....	130	.....	2,980
Solid tires	.....	.....	.....	215
Boots and shoes *doz. pairs*	1,008	1,434	19,416	21,980
Other rubber manufactures	.....	5,018	.....	39,512
Totals	.....	£11,002	.....	£122,111

* Motor cars, motorcycles, parts and accessories, liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts, and accessories were exempt from duty until Apr. 30, 1926, inclusive, and tires and tubes until Apr. 11, 1927, inclusive.

When Sodium Silicate Bounces

An odd property of ordinary water glass is its springiness in a semi-jellified condition. If a slowly flowing solution is thrown down, it will bounce like a rubber ball; yet on coagulation of the jelly every trace of resilience disappears.

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CONTINUED

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Cutting Out Waste Talk

Advertising saves the time of buyer and salesman through cutting out the preliminaries to the interview and enables both to get down quickly to business. It penetrates what might otherwise prove a closed door to the seller. It accelerates a transaction and gives the salesman more time for other interviews.

• • •

By letting the rubber trade, through its acknowledged authority and most welcome visitor, IRW, know how you can be of service, you not only promote direct purchasing but simplify personal selling; you speed up your own sales as you aim also to speed up your customer's business, and make both more profitable.

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QUALITY

The standard quality of our machinery and equipment for the rubber and allied industries is well known.

We have specialized for many years in supplying guaranteed re-built machinery and carry in stock a most complete inventory of machines, parts, fittings and instruments.

Whatever your demands may be, we are sure to have the exact machine for your purpose, and can give you prompt delivery.

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We can supply you with:

MILLS
CALENDERS
WASHERS
CRACKERS
TUBING MACHINES
STRAINERS
DRIERS
CEMENT CHURNS
BIAS CUTTERS
SLITTERS
TIRE BUILDERS
HYDRAULIC PUMPS
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Immediate Deliveries from Stock

MILLS—6″x12″, 12″x24″, 16″x36″, 16″x42″, 18″x50″, 20″x22″x60″, 22″x72″, 24″x26″x84″ Farrel, Thropp, Vaughn, Allen, W.S.M., Birmingham.

CALENDERS—100″, 66″, 60″, 54″, 48″, 30″, 24″, in 2, 3, 4-Roll Farrel, Adamson, Vaughn.

TUBERS—Nos. 1, 2, 3, 4, Royle Perfected.

STRAINERS—6″, 8″, 10″ Allen, Adamson, etc.

HYDRAULIC PRESSES—14″x14″ (Ten Platens), 24″x24″, 30″x30″, 36″x36″, 34″x34″ (Seven Platens), 40″x40″, 44″x44″, 48″x48″, etc.

MIXERS—4-100 gallon W.P. Mixers; 2-100 gallon Day Mixers, 50, 75, 200 gal.; other makes, Jacketed and Unjacketed.

PUMPS—High and low pressure Triplex, all sizes.

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Rims Approved by The Tire & Rim Association, Inc.

Rim Size	Nine Months, 1930 Number	Nine Months, 1930 Per Cent	Nine Months, 1931 Number	Nine Months, 1931 Per Cent
Motorcycle				
24x3	517	0.0	404	0.0
28x3 CC	592	0.0	.....	...
Clincher				
30x3½	54,901	0.4	22,483	0.2
31x4	150	0.0	.....	...
17" Balloon				
17x3.25	3,056	0.0	28,721	0.2
17x4	42	0.0	94,694	0.9
17x4½	4,935	0.0	159,113	1.5
17x5	3,789	0.0	7,204	0.1
18" Balloon				
18x3.00	.....	...	316	0.0
18x3½	645	0.0	.....	...
18x4	915,324	6.9	218,392	2.1
18x3.25	78,329	0.5	134,734	1.3
18x4½	104,672	0.7	20,411	0.2
18x5	63,619	0.4	41,840	0.4
18x6	12,370	0.1	18,783	0.2
19" Balloon				
19x2.75	2,390,698	15.9	97,195	0.9
19x3.00	580,872	3.9	96,787	0.9
19x3½	181,463	1.2	4,797	0.0
19x4	1,429,754	9.5	443,134	4.2
19x3.25	25,923	0.2	3,242	0.0
19x4½	453,452	3.0	275,024	2.6
19x5	112,234	0.7	69,290	0.7
19x6	2,487	0.0	.....	...
20" Balloon				
20x2.75	32,500	0.2	43,897	0.4
20x3½	46,189	0.3	18,072	0.2
20x4	120,622	0.8	24,049	0.2
20x4½	110,777	0.7	15,303	0.1
20x5	12,095	0.1	17,803	0.2
20x6	1,336	0.0	4,569	0.0
21" Balloon				
21x3½	143,594	0.9	60,645	0.6
21x2.75	.....	...	1,023	0.0
21x4	24,862	0.2	9,657	0.1
21x4½	32,003	0.2	11,895	0.1
21x5	1,529	0.0	2,066	0.0
21x6	3,503	0.0	1,734	0.0
22" Balloon				
22x4	1,358	0.0	153	0.0
22x4½	303	0.0	.....	...
Drop Center				
17x3.00 D	.....	...	10	0.0
17x3.25 E	.....	...	8,113	0.1
17x3.62 F	.....	...	719	0.0
17x4.00 F	.....	...	6	0.0
17x4.18 F	.....	...	65	0.0
18x2.15 B	67,648	0.4	19,660	0.2
18x3.00 D	83	0.0	371	0.0
18x3.25 E	.....	...	381,239	3.6
18x3.62 F	.....	...	12,821	0.1
18x4.00 F	.....	...	10,515	0.1
18x4.19 F	.....	...	57	0.0
19x2.15 B	31,879	0.2	8,958	0.1
19x2.75 D	39,311	0.3	3,895	0.0
19x3.00 D	5,172,787	34.4	5,778,043	55.0
19x3.25 E	.....	...	80,959	0.8
19x3.62 F	.....	...	1,971	0.0
19x4.00 F	.....	...	32,078	0.3
20x2.75 D	.....	...	423	0.0
20x4.00 F	10,565	0.1	.....	...
Semi Drop Base Split				
17x3.00 D	.....	...	28	0.0
17x3.25 E	40	0.0	14,759	0.1
17x3.62 F	.....	...	4,597	0.0
18x3.00 D	.....	...	25	0.0
18x3.25 E	7,590	0.1	26,241	0.2
19x3.00 D	98,453	0.6	126,269	1.2
19x3.62 F	.....	...	20	0.0
High Pressure				
30x3½	11,695	0.1	13,009	0.1
32x4	8,092	0.1	1,987	0.0
32x4½	10,233	0.1	4,155	0.0
34x4½	3,338	0.0	197	0.0
18" Truck				
28x5	.....	...	1,895	0.0
32x7	.....	...	9,517	0.1
34x8	.....	...	1,475	0.0
20" Truck				
30x5	1,952,024	13.0	1,633,987	15.6
32x6	268,879	1.8	143,743	1.4
34x7	178,716	1.2	95,725	0.9
36x8	93,234	0.6	55,666	0.5
9-10x20	10,545	0.1	7,701	0.1
40x10.50	1,016	0.0	1,629	0.0
42x11	937	0.0	1,216	0.0
22" Truck				
36x7	2,190	0.0	2,221	0.0
38x8	15,453	0.1	8,544	0.1
9-10x22	1,463	0.0	3,626	0.0
24" Truck				
34x5	1,935	0.0	1,125	0.0
36x6	7,636	0.0	3,167	0.0
38x7	15,647	0.1	9,961	0.1
40x8	41,651	0.3	33,584	0.3
9-10x24	4,402	0.0	8,439	0.1
44x10	383	0.0	.....	...
46x11	305	0.0	566	0.0
Airplane				
18x3	563	0.0	200	0.0
24x3	797	0.0	.....	...
24x4	.....	...	109	0.0
32x6	209	0.0	.....	...
36x8	103	0.0	.....	...
44x10	125	0.0	114	0.0
58x14	80	0.0	.....	...
Totals	15,010,502	...	10,502,830	...

Statement of "India Rubber World"

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of India Rubber World, published monthly at New York, N. Y., for October 1, 1931.

State of New York } ss.
County of New York }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared William M. Morse, who, having been duly sworn according to law, deposes and says that he is the Editor of India Rubber World, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers, are: publisher, Federated Business Publications, Inc., 420 Lexington Avenue, New York, N. Y.; editor, William M. Morse, 420 Lexington Avenue, New York, N. Y.; managing editor, William M. Morse, 420 Lexington Avenue, New York, N. Y.; business managers, none.

2. That the owner is: Federated Business Publications, Inc., Edward Lyman Bill, Inc., Bill, Brown & Bill Pub. Corp., Caroline L. Bill, Raymond Bill, Edward L. Bill, Randolph Brown, J. B. Spillane, all located at 420 Lexington Avenue, New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

William M. Morse, Editor.

Sworn to and subscribed before me this 17th day of September, 1931.

[SEAL.] Wm. A. Low.

Notary Public, N. Y. Co. No. 753. Reg. No. 3L487. Certificate filed in Queens Co. No. 1126. (My commission expires March 30, 1933.)

Tire Production Statistics

	Pneumatic Casings—All Types Inventory	Production	Total Shipments
1928	10,217,708	58,457,873	55,721,937
1929	9,470,368	54,980,672	55,515,884
1930	7,202,750	40,772,378	42,913,108
1931			
January	7,165,846	2,939,702	2,995,479
February	7,628,520	3,188,274	2,721,347
March	8,011,592	3,730,061	3,297,225
April	8,025,135	3,955,491	3,945,525
May	8,249,856	4,543,003	4,332,137
June	8,357,768	4,537,970	4,457,509
July	7,935,565	3,941,187	4,369,526
August	7,117,037	3,124,746	3,967,987

	Solid and Cushion Tires Inventory	Production	Total Shipments
1928	152,120	508,223	512,602
1929	122,200	407,347	436,027
1930	75,871	204,340	250,635
1931			
January	75,205	12,631	13,072
February	73,338	11,358	12,915
March	68,584	11,424	16,152
April	64,369	11,610	15,445
May	61,272	11,369	15,566
June	57,462	11,764	15,364
July	54,692	13,370	16,051
August	50,994	11,643	15,758

	Inner Tubes—All Types Inventory	Production	Total Shipments
1928	12,087,464	60,131,381	57,845,189
1929	10,245,365	55,062,886	56,473,303
1930	7,999,477	41,936,029	43,952,139
1931			
January	7,551,503	2,898,405	3,249,734
February	7,936,773	3,132,770	2,720,135
March	8,379,974	3,559,644	3,031,279
April	8,330,155	3,693,222	3,708,949
May	8,438,799	4,329,731	4,224,594
June	8,403,401	4,286,467	4,317,543
July	7,671,801	3,964,174	4,664,964
August	7,019,217	3,548,335	4,240,403

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires Cotton Fabric Pounds	Crude Rubber Pounds	Consumption of Motor Gasoline (100%) Gallons
1928	222,243,398	600,423,401	13,633,452,000
1929	208,824,653	598,994,708	14,748,552,000
1930	158,812,462	476,755,707	16,200,894,000
1931			
January	12,738,467	36,318,980	1,127,532,000
February	12,002,161	36,651,119	1,097,208,000
March	14,040,803	41,850,638	1,303,302,000
April	15,243,625	45,016,344	1,402,800,000
May	18,009,764	53,417,709	1,499,904,000
June	17,084,749	51,279,827	1,611,540,000
July	15,139,769	46,696,925	1,657,446,000
August	11,745,425	36,231,633	1,657,278,000

Rubber Manufacturers Association figures representing 80 per cent of the industry since January, 1929, with the exception of gasoline consumption.

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BALATA.
Hankin, Geo., & Co., London, England.
Jacoby, Ernest, Boston, Mass.
Weber, Hermann, Hoboken, N. J.
Wood, Chas. E., Inc., New York, N. Y.

BALATA—Refined.
Wood, Chas. E., Inc., New York, N. Y.

BALLS—Billiard, Bowling, etc.
Stowe & Woodward Co., Newton Upper Falls, Mass.

BALLS—Golf.
Jenkins Bros., New York, N. Y.

BALLS—Tank.
Canfield, H. O., Co., The, Bridgeport, Conn.
Canfield Rubber Co., The, Bridgeport, Conn.
Jenkins Bros., New York, N. Y.

BALLS, DOLLS AND TOYS.
Jenkins Bros., New York, N. Y.

BAND CUTTING MACHINES.
Adamson Machine Co., The, Akron, Ohio.
Albert, L., & Son, Trenton, N. J.
Black Rock Mfg. Co., Bridgeport, Conn.

BARYTES.
Grasselli Chemical Co., The, Cleveland, Ohio.
Hall, C. P., Co., The, Akron, Ohio.
Hammill & Gillespie, Inc., New York, N. Y.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer, Inc., New York.

BATH MATS—Sponge Rubber.
Rand Rubber Co., Inc., Brooklyn, N. Y.

BATHING CAPS.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Plymouth Rubber Co., Inc., Canton, Mass.

BATHING SPECIALTIES.
Plymouth Rubber Co., Inc., Canton, Mass.

BEAD BUILDING MACHINES.
Albert, L., & Son, Trenton, N. J.
National Rubber Machinery Co., Akron, Ohio.
Utility Manufacturing Co., Cudahy, Wis.

BEAD FLIPPERS.
Albert, L., & Son, Trenton, N. J.
Utility Manufacturing Co., Cudahy, Wis.

BELT MAKING MACHINES.
Farrel-Birmingham Co., Inc., Ansonia, Conn.

BELTING—Rubber.
Acme Rubber Mfg. Co., Trenton, N. J.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Home Rubber Co., Trenton, N. J.
Jenkins Bros., New York, N. Y.
Thermoid Rubber Co., Trenton, N. J.

BENTONITE.
Hammill & Gillespie, Inc., New York, N. Y.

BENZOL.
Wishnick-Tumpeer, Inc., New York.

BLANC FIXE.
Grasselli Chemical Co., The, Cleveland, Ohio.
Hall, C. P., Co., The, Akron, Ohio.
Huber, J. M., Inc., New York, N. Y.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

BLANKETS—Printers'.
Boston Woven Hose & Rubber Co., Cambridge, Mass.

BOILERS.
Akron Equipment Co., The, Akron, Ohio.
Biggs Boiler Works Co., The, Akron, Ohio.

BOOTS AND SHOES.
Gutta Percha & Rubber, Ltd., Toronto, Canada.

BRAIDERS—Hose.
Albert, L., & Son, Trenton, N. J.
New England Butt Co., Providence, R. I.

BRAKE LINING—Asbestos.
Thermoid Rubber Co., Trenton, N. J.

BRAKE LINING—Industrial.
Garlock Packing Co., The, Palmyra, N. Y.

BRANDS—Rubber Labels.
Naugatuck Chemical Co., New York, N. Y.

BREAKER AND CHAFER FABRIC.
Lane, J. H., & Co., New York and Chicago.

BRUSHING MACHINES AND BRUSHES.
Albert, L., & Son, Trenton, N. J.
Curtis & Marble Machine Co., Worcester, Mass.

For Complete Addresses See Advertisements—Index Page 134

Plantation Rubber Crop Returns by Months

Summary of 615 Producing Companies

	Br. N. Borneo (26 Companies)		Ceylon (102 Companies)		India and Burma (21 Companies)		Malaya (338 Companies)		Netherlands East Indies — Java (60 Companies)		Netherlands East Indies — Sumatra (60 Companies)		Miscellaneous (8 Companies)		Total (615 Companies)	
	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index
1931																
January	473	96.7	1,776	87.0	397	70.6	13,006	104.6	3,020	115.0	4,324	107.2	225	124.3	23,221	99.8
February	365	74.6	1,138	55.8	160	28.5	11,551	92.9	2,631	100.2	3,721	92.3	130	71.8	19,696	84.7
March	378	77.3	1,065	52.2	510	90.7	11,439	92.0	3,174	120 9	4,173	103.5	182	100.6	20,921	89.9
April	351	71.8	1,699	83.2	672	119.6	10,423	83.8	3,069	116.9	3,726	92.4	208	114.9	20,148	86.6
May	428	87.5	1,340	65.7	655	116.5	11,669	93.8	3,235	123.2	4,075	101.1	207	114.4	21,609	96.6
June	411	84.0	888	43.5	232	41.3	11,761	94.6	3,043	115.9	4,222	104.7	208	114.9	20,765	92.9
July	407	83.2	1,239	60.7	213	37.9	13,216	106.3	3,059	116.5	4,476	111.0	210	116.0	22,820	102.0
August	417	85.3	1,140	55.9	108	19.2	13,105	105.4	2,357	89.8	4,586	113.7	208	114.9	21,921	98.0
September	374	76.5	1,223	59.9	287	51.1	12,665	101.9	2,384	90.8	4,546	112.7	185	102.2	21,664	96.9
Nine months ending September, 1931	3,604	....	11,508	....	3,234	....	108,835	....	25,972	..	37,849	....	1,763	...	192,765	....

NOTE. Index figures throughout are based on the monthly average for 1929 = 100. Issued October 10, 1931, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.

Rubber Goods Production Statistics

	1931								1930				
TIRES AND TUBES	Aug.	July	June	May	Apr.	Mar.	Feb.	Jan.	Dec.	Nov.	Oct.	Sept.	Aug.
Pneumatic casings													
Production *thousands*	....	3,941	4,538	4,543	3,955	3,730	3,188	2,940	2,251	2,123	2,866	2,692	3,332
Shipments													
Domestic *thousands*	....	4,224	4,320	4,197	3,804	3,143	2,580	2,855	2,550	2,119	2,613	3,360	3,976
Exports *thousands*	....	125	137	135	142	155	142	140	139	148	186	165	164
Stocks, end of month *thousands*	....	7,936	8,358	8,250	8,025	8,012	7,629	7,166	7,203	7,676	7,842	7,849	8,678
Solid and cushion tires													
Production *thousands*	....	13	12	11	12	11	11	13	13	13	18	14	16
Shipments													
Domestic *thousands*	....	15	14	14	14	15	12	12	12	13	19	22	22
Exports *thousands*	....	1	1	1	1	1	1	1	1	1	1	1	1
Stocks, end of month *thousands*	....	55	57	61	64	69	73	75	76	76	78	82	90
Inner tubes													
Production *thousands*	....	3,964	4,286	4,330	3,693	3,560	3,133	2,898	2,448	2,144	3,161	3,053	3,837
Shipments													
Domestic *thousands*	....	4,569	4,228	4,135	3,610	2,922	2,619	3,147	2,634	2,147	2,659	3,525	4,492
Exports *thousands*	....	96	89	89	99	109	101	102	96	84	119	108	118
Stocks, end of month *thousands*	....	7,672	8,403	8,439	8,330	8,380	7,937	7,552	7,999	8,250	8,414	8,052	8,589
Raw material consumed													
Fabrics *thous. of lbs.*	....	15,140	17,085	18,010	15,244	14,041	12,002	12,738	8,358	8,418	11,780	10,917	13,223
Crude rubber *thous. of lbs.*	....	46,697	51,280	53,418	45,016	41,851	36,651	36,319	25,537	26,253	36,097	33,382	40,736
MISCELLANEOUS RUBBER PRODUCTS													
Calendered rubber clothing													
Net orders *no. coats and sundries*	21,580	17,932	21,161	19,380	16,846	19,380	16,361	21,884	12,881	15,493	25,082	39,364	26,348
Production *no. coats and sundries*	27,080	14,431	15,419	18,094	16,803	19,220	18,276	13,059	20,791	22,623	41,291	37,097	44,952
Mechanical rubber goods, shipments													
Belting *thous. of dollars*	....	914	798	790	832	889	722	759	675	779	954	1,045	1,248
Hose *thous. of dollars*	....	1,436	1,650	1,857	2,129	1,892	1,611	1,440	1,337	1,276	1,554	1,473	1,682
All other *thous. of dollars*	....	1,356	1,431	1,584	1,656	1,631	1,378	1,400	1,326	1,345	1,678	1,565	1,622
Total *thous. of dollars*	....	3,706	3,879	4,231	4,617	4,412	3,711	3,599	3,338	3,400	4,186	4,083	4,552
Rubber bands, shipments *thous. of lbs.*	195	246	209	215	259	231	222	211	165	165	197	172	164
Rubber flooring, shipments *thous. of sq. ft.*	595	577	576	569	569	496	366	365	597	432	682	529	559
Rubber and canvas footwear													
Tennis													
Production *thous. of pairs*	....	836	1,999	2,142	2,591	2,609	2,492	2,409	1,875	1,940	1,821	1,445	1,672
Shipments, domestic *thous. of pairs*	....	1,520	2,657	4,372	3,624	2,879	2,343	2,318	871	319	562	1,441	1,389
Exports *thous. of pairs*	....	125	100	121	150	236	200	110	175	148	263	350	238
Stocks *thous. of pairs*	....	5,957	6,766	7,523	9,889	10,960	11,451	11,506	10,633	10,712	9,239	8,248	8,597
Waterproof, total													
Production *thous. of pairs*	....	1,570	1,922	1,261	1,102	874	958	1,272	2,214	2,736	2,960	2,822	2,616
Shipments, domestic *thous. of pairs*	....	1,510	1,173	626	1,070	944	1,015	1,549	3,888	4,212	5,299	4,968	3,430
Exports *thous. of pairs*	....	117	108	50	72	53	92	74	63	135	287	548	384
Stocks *thous. of pairs*	....	16,978	16,763	16,357	15,733	15,803	16,030	16,179	17,172	18,449	20,054	22,680	25,416
Grand total													
Production *thous. of pairs*	....	2,407	3,921	3,402	3,693	3,483	3,450	3,681	4,089	4,675	4,781	4,267	4,288
Shipments, domestic *thous. of pairs*	....	3,030	3,830	4,998	4,694	3,822	3,358	3,867	4,759	4,531	5,861	6,409	4,820
Exports *thous. of pairs*	....	242	208	171	222	288	292	184	237	282	550	898	622
Stocks *thous. of pairs*	....	22,935	23,528	23,881	25,622	26,762	27,481	27,685	28,806	29,160	29,293	30,928	34,013
Rubber heels													
Production *thous. of pairs*	....	15,361	17,093	15,474	15,408	14,661	13,156	12,973	13,101	11,083	16,460	14,322	13,735
Shipments													
Exports *thous. of pairs*	....	540	630	612	578	577	658	748	838	880	966	1,083	780
Repair trade *thous. of pairs*	....	4,058	4,946	3,975	4,038	4,868	4,854	3,939	3,450	4,473	8,291	6,681	6,622
Shoe manufacturers *thous. of pairs*	....	11,177	10,522	9,693	10,112	10,991	8,397	8,471	6,618	4,578	9,354	9,244	8,813
Stocks, end of month *thous. of pairs*	....	27,006	27,898	28,491	27,764	26,708	29,335	30,302	29,741	29,130	29,353	31,601	33,226
Rubber-proofed fabrics, production													
Auto fabrics *thous. of yds.*	....	531	701	982	710	738	644	577	476	532	915	733	678
Raincoat fabrics *thous. of yds.*	....	1,843	1,355	1,066	1,040	863	567	738	697	1,426	3,040	3,249	1,805
All other *thous. of yds.*	....	963	1,156	1,002	1,271	1,168	973	891	736	864	1,254	1,064	975
Total *thous. of yds.*	....	3,337	3,212	3,050	3,381	2,769	2,184	2,206	1,909	2,822	5,209	5,046	3,458
Rubber soles													
Production *thous. of pairs*	....	2,864	3,177	2,885	2,692	2,292	2,724	2,481	3,021	1,426	3,056	2,193	1,473
Shipments													
Exports *thous. of pairs*	....	67	59	62	69	14	36	11	58	60	82	74	74
Repair trade *thous. of pairs*	....	196	225	330	255	408	290	287	243	280	492	333	317
Shoe manufacturers *thous. of pairs*	....	2,569	2,899	2,651	2,474	2,145	2,259	2,090	2,305	1,011	2,638	1,691	1,161
Stocks, end of month *thous. of pairs*	....	2,475	2,461	2,655	2,764	2,876	3,167	3,032	2,917	2,390	2,520	2,729	2,289

Source: *Survey of Current Business*, Bureau of Foreign and Domestic Commerce, Washington. D. C.